



CHAPTER 4 AFFECTED ENVIRONMENT

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4.0 Affected Environment

4.1 Introduction

The National Environmental Policy Act (NEPA) requires that documents, such as this comprehensive management plan (CMP), disclose the environmental effects of a proposed federal action. Included in this disclosure is a description of the environment of the area affected by the alternatives under consideration. This chapter is a description of the existing environmental conditions in the study area related to the Captain John Smith Chesapeake National Historic Trail. The “Affected Environment” describes the natural, cultural, and socioeconomic environments in the vicinity of the trail that may experience or cause impact if one or more alternative presented in this CMP is implemented.

The alternatives in this CMP are intended to provide broad management directions, because of the general and programmatic nature of the alternatives, the potential consequences of each alternative is analyzed in similarly general terms. Consistent with the NEPA and NHPA Section 106, the NPS will conduct additional environmental analyses with appropriate documentation before implementing site-specific actions.

Chapter 4 of the CMP/EA provides an overview of the existing conditions in the vicinity of the Captain John Smith Chesapeake National Historic Trail that could be affected by trail management actions. In discussing the existing environment, this chapter will first summarize the trail setting, trail significance, resources

This overview will discuss the following topics in this order:

- aquatic resources
- terrestrial resources
- threatened, endangered, and rare species
- archeological resources
- historic structures
- ethnographic resources
- cultural landscapes
- trail access
- visitor experience
- socioeconomic environment
- trail administration and management

Topics considered but dismissed from further analysis are included in section 5.2, along with a brief discussion of the reasons for dismissal.

4.2 Trail Setting

The Captain John Smith Chesapeake National Historic Trail is composed of multiple routes extending approximately 3,000 miles along the Chesapeake Bay and portions of nine major tributaries to the Chesapeake Bay, including the James, Nanticoke, Patapsco, Patuxent, Potomac, Rappahannock, Sassafras, Susquehanna, and York Rivers. The trail falls within the states of Virginia, Maryland, Delaware, and the District of Columbia.

4.2.1 Trail Significance

The National Historic Trail is considered nationally significant for the Chesapeake Bay and river voyages of Captain John Smith it commemorates. These voyages first revealed to Europeans the complexity and richness of the Chesapeake Bay region. Smith's maps and writings spurred the development of Great Britain's Mid-Atlantic colonies, and influenced colonial affairs for more than a century. The voyages impacted American Indian inhabitants by accelerating the processes that destroyed the Powhatan polity and other polities, disrupting the native peoples' lifeways throughout the Mid-Atlantic region, establishing the primacy of English culture in the region and beyond. English settlement in the region marked the beginning of significant human influence on the transformation of the Chesapeake Bay's environment.

▪ Exploratory Voyages of Captain Smith on the Chesapeake Bay and its Tributaries in 1607-1609

Captain John Smith's explorations of the Chesapeake Bay and its tributaries formed the basis of his published writings and maps. In turn, those publications encouraged English settlement of Virginia, the Chesapeake Bay area, and the Eastern Seaboard. These writings also suggested a policy of private land ownership that the Virginia Company and the Crown eventually adopted. This policy and the success of the English colonization significantly altered the environment of the Chesapeake Bay and American Indian lifeways.

Smith's publications were unique for the time because he wrote at length from his own experience (albeit sometimes exaggerated), observations, and attempts to understand what he had done and seen and describe it for a distant audience. His maps were so accurate that colonists found them useful for most of the rest of the 17th century and modern archeologists have employed them to locate Indian towns. Smith's accounts have profoundly influenced assumptions about the early colonial experience, and certain aspects – such as the story of Pocahontas – have even entered the popular culture.

▪ American Indian Societies and Cultures of the 17th Century

The Chesapeake Bay region of 1608 was home to thousands of native people who lived along its shores and tributaries in large and small towns. They belonged to complex societies consisting of tribes, clans, chiefdoms, and other polities. Indians in this region hunted, fished, and farmed, activities that both preserve and altered their environment. They used the natural world for their subsistence in a manner that

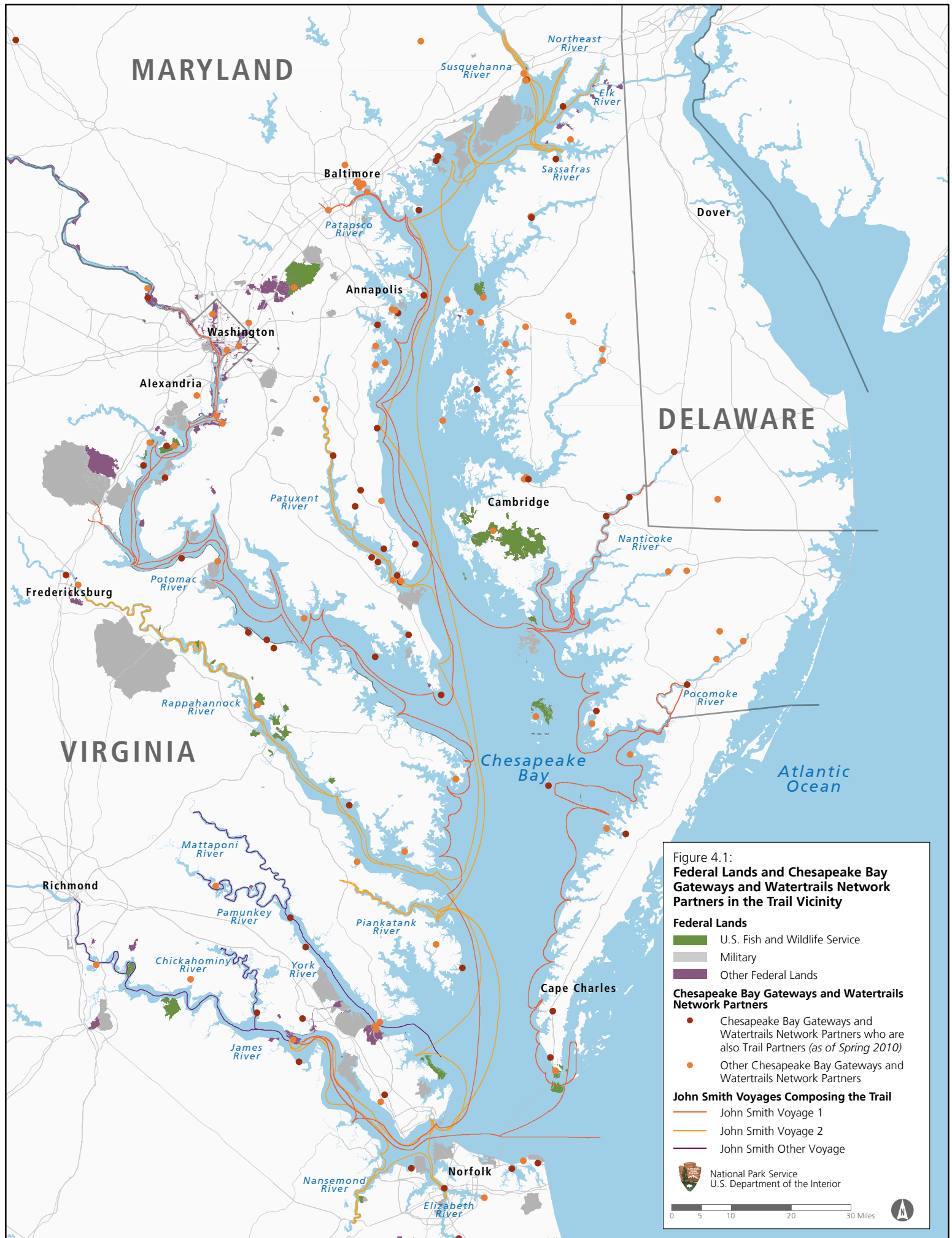


Figure 4.1:
Federal Lands and Chesapeake Bay Gateways and Watertrails Network Partners in the Trail Vicinity

- Federal Lands**
- U.S. Fish and Wildlife Service
 - Military
 - Other Federal Lands
- Chesapeake Bay Gateways and Watertrails Network Partners**
- Chesapeake Bay Gateways and Watertrails Network Partners who are also Trail Partners (as of Spring 2010)
 - Other Chesapeake Bay Gateways and Watertrails Network Partners
- John Smith Voyages Composing the Trail**
- John Smith Voyage 1
 - John Smith Voyage 2
 - John Smith Other Voyage

National Park Service
 U.S. Department of the Interior

0 5 10 20 30 Miles



sustained over the long term the bounty on which they depended for survival. They also maintained an elaborate trading and communication network that extended for hundreds of miles, reaching as far as the Great Lakes. The English newcomers consistently underestimated the sophistication of the American Indian world they were encountering.

John Smith's writings offer an insightful (though biased) glimpse into this world. His writings reveal that the success of his Chesapeake Bay voyages, as well as the survival of the English colony, depended largely on the goodwill and assistance of American Indians in the region. Comparing Smith's writings to his maps, it is apparent that he relied on American Indians for information about rivers and lands he had neither the time nor the means to explore.

Our present understanding of the American Indian world of Smith's time comes not only from Smith's writings but the subsequent work of archeologists and anthropologists. A host of publications, many of them issued in the last dozen years, have in some cases confirmed and in other cases contradicted what Smith thought he understood about the American Indian people, their leaders, and their lives. Although the Chesapeake Bay region's native inhabitants were largely displaced by the newcomers to America, the continued presence of their descendants offers an opportunity for visitors to understand their role in utilizing, altering, and preserving the Chesapeake Bay and its resources.

▪ **Natural History of the Chesapeake Bay of the 17th Century**

When Smith explored the Chesapeake Bay and its tributaries in the summer of 1608, he found an abundance of natural resources, including fish, birds, mammals, and plant life. Smith had harvested deer, turkeys, and fish while in Jamestown. He had also observed oyster beds in that area, but it wasn't until he explored the Chesapeake Bay that he discovered the extent of the vast domain these beds occupied.

The Chesapeake Bay's natural resources, as Smith reported them in his published works, helped attract English settlement. The wildlife provided a base of sustenance for European colonists, the trees were used to construct their houses and vessels, and the land was transformed into farmsteads. Harvesting fish, crabs, and oysters has historically constituted a major industry for Bay-area residents. While pollution and overuse have reduced these resources, these industries continue to be a significant part of the Chesapeake Bay economy.

Efforts to improve Chesapeake Bay ecosystems and natural resources have been underway for years with limited success. The Chesapeake Bay will never again look like it did in Smith's time or contain the vast array of floral and faunal life he observed. However, some portions of the Chesapeake Bay and tributaries still convey a sense of how the bay looked and was experienced in the 17th century. Meanwhile, other portions of the Chesapeake Bay contain landscapes that can be interpreted to understand the changes to the Bay in the last 400 years.

4.3 Natural Resources

The Chesapeake Bay is the largest estuary in the United States and one of the largest in the world. It is approximately 200 miles long, stretching from the mouth of the Susquehanna River at Havre de Grace, Maryland, to Norfolk, Virginia. The Chesapeake Bay varies in width from approximately 3 miles at its narrowest to 35 miles at its widest near the mouth of the Potomac River. There are approximately 11,684 miles of shoreline along the Chesapeake Bay and its major tributaries.

The Chesapeake Bay formed during the last ice age when melting glaciers caused sea level rise. The deepest portions of the Bay trace the ancient path of the Susquehanna River; its shallower parts were formed when the land was flooded by rising ocean waters. The waters are home to numerous fish and shellfish, and on occasion visiting ocean fish and aquatic mammals. Vast meadows of submerged aquatic vegetation, banks of clams and oysters, and large populations of blue crabs reside in the Bay.

The trail route extends up portions of eight of the Chesapeake Bay's largest tributaries: the James, York, Rappahannock, Potomac, Patuxent, Patapsco, Susquehanna, and Nanticoke Rivers. These major rivers provide over 90 percent of the Bay's freshwater volume. The largest tributary – the Susquehanna River – accounts for over half of the freshwater discharged into the Bay. The major rivers link the area's cultural and historic resources and provide a variety of recreational opportunities. These waterways were once important transportation corridors that opened up the area for settlement and trade.

The Chesapeake Bay is an estuary, in which fresh river water mixes with salt water from the Atlantic Ocean. The average salinity of the Chesapeake Bay varies between 0 parts per thousand (ppt) (i.e., freshwater) near the head of the Bay, to near saltwater (35 ppt) at the mouth of the Bay, where currents bring in sea water from the Atlantic Ocean. The salinity slowly decreases the further away from the mouth until it has no salinity (i.e., 0 ppt or freshwater) at the tributary headwaters. Tidewater occurs in lower portions of tributaries affected by tides in which some salinity (i.e., > 0 ppt) is present.

Much of the Chesapeake Bay is shallow (i.e., <20 feet deep), with water levels that change continuously with the tides and thus undergo extreme environmental fluctuations through the year. In the summer, shallow waters become very hot, and in winter ice often covers the water. Shallow waters are constantly affected by wind and waves which suspend sediments and increase turbidity. Spring rains can lead to runoff of sediment and nutrients from the land and into the Chesapeake Bay and tributaries, which clouds shallow water. Heavy rainstorms also constantly affect the salinity of the shallow waters.

The health of the Chesapeake Bay and watershed is severely impacted from pollutants, including nitrogen, phosphorus, and sediment; land use, including population growth, impervious surface, and loss of forest cover; natural factors, including weather and river flow, and other pressures, including climate change, invasive species, and fisheries harvest.

4.3.1 Aquatic Resources

The Chesapeake Bay watershed provides food, water, cover, and nursery areas to an estimated 350 species of finfish, 173 species of shellfish, 29 species of waterfowl, and is a resting ground to an estimated 1 million migratory waterfowl every winter (NPS, 2009). The rich plant communities that grow in shallow waters, such as submerged aquatic vegetation and tidal marshes, provide key habitat for many invertebrates, fish, and waterfowl in various life stages. In this section fish, marine invertebrates, other marine animals, and waterfowl in the Chesapeake Bay and tributaries will be summarized in that order.

■ Aquatic Wildlife

Fish. Fish in the Chesapeake Bay can be divided into resident and migratory. Of the approximately 350 species of fish known to inhabit the Chesapeake Bay, 32 species are year-round residents. The Chesapeake Bay anchovy is a resident species and considered the most abundant fish in the Chesapeake Bay. It is a small forage fish that eats plankton and whom larger fish and/or birds consume. As such, Chesapeake Bay anchovies form a critical link in the food web of the Bay. In the winter, Chesapeake Bay anchovies remain in the deep waters of the Chesapeake Bay, while in warmer weather they cling to the shoreline swimming in schools feeding on zooplankton.

Migratory fish include those that live in freshwater but travel to high-salinity ocean waters to spawn. The only species in the Chesapeake Bay that does this is the American eel which leaves the Chesapeake Bay to spawn in the Sargasso Sea. Other migratory fish including American shad, blue back herring, and striped bass, which migrate into the Chesapeake Bay's low salinity and/or freshwater rivers to spawn. The eggs hatch and juvenile stages for these fish are in freshwater or low salinity waters of the upper Chesapeake Bay and tributaries, and as they mature they move out to the ocean. As adults, these species return to the Chesapeake Bay and freshwater tributaries for reproduction.

Other fish migrate into the Chesapeake Bay during the spring and summer to forage and prey within the Chesapeake Bay. Species such as menhaden, flounder, bluefish, and Spanish mackerel visit the Chesapeake Bay during the spring and summer, and then migrate back into the ocean during the fall and winter. Juvenile sea turtles also come into the Chesapeake Bay for the abundant prey during the spring and summer months before returning to the ocean in the fall.

Marine Invertebrates. The Chesapeake Bay has a diverse population of marine invertebrates living within the water column or buried within bottom sediments throughout the Chesapeake Bay. Large populations of tiny floating zooplankton invertebrates (e.g., copepods) consume phytoplankton, which are subsequently consumed by small grazing "planktivore" fish (e.g., anchovy or menhaden). These are then eaten by larger fish (e.g., striped bass, bluefish); as such these tiny invertebrates are an integral part of the Chesapeake Bay's ecosystem.

The most well known invertebrates of the Chesapeake Bay are the blue crab and oyster, both of which occur along the bottom and are harvested commercially. In addition, various species of clam occur in the bottom sediments of the Chesapeake Bay. Numerous gastropods (e.g., snails, arks, and whelks) move along the bottom sediments searching for food or prey. Several small shrimp (e.g., opossum shrimp and grass shrimp) contribute significantly to the food chain of submerged aquatic vegetation systems where they are consumed by young fish (Lippson and Lippson, 1997).

Other Marine Animals. Sea turtles enter the Chesapeake Bay to forage during summer months. Porpoises also enter the Chesapeake Bay during the summer to forage on the abundant small fish populations. Sandbar sharks and cow nose rays are commonly observed during the summer. Occasionally, a migrating whale will enter the Chesapeake Bay feeding on fish and other organisms.

Waterfowl. Nearly 30 species of waterfowl visit the Chesapeake Bay every winter. Some species include Canada geese, snow geese, mallards, mergansers, canvasbacks, ruddy ducks, scaups, buffleheads, common goldeneyes, pintails, teals, shovelers, oldsquaw, mute swans, tundra swans, coots, and scoters.

■ Shoreline Habitats

Shorelines bordering the Chesapeake Bay contain a variety of habitats, including beaches, intertidal flats, salt marshes, brackish marshes, tidal freshwater marshes, and forested wetlands. In addition, important habitats occur in submerged aquatic vegetation occurs underwater in shallow areas (< 6 to 8 feet deep). In this section these eight types of habitats along the shorelines of the Chesapeake Bay and tributaries will be summarized in that order.

Beaches. The sandy beach habitat is common along shorelines near areas exposed to wide open waters strongly affected by ocean currents and waves. Exposed beaches in the middle and upper Chesapeake Bay are generally narrower than those closer to the mouth of the Chesapeake Bay. Most of the beach habitat is inundated twice daily with the tides, and is often exposed to wind driven waves. The beach is a harsh environment and very few species have adapted to live in this habitat. These habitats are generally devoid of vegetation other than occasional seaweed (e.g., sea lettuce) which may have washed ashore. Characteristic animal species often found on beaches include beach hoppers, mole crabs, horseshoe crabs, ghost crabs, and tiger beetles.

During the winter, overwintering shorebirds are a common site along beaches. Typical shorebirds include sanderlings, willets, black bellied plovers, and ruddy turnstones. In addition, gulls and terns are frequently observed along beaches.

Intertidal Flats. Intertidal flats are shoreline areas that are subject to daily inundation during high tides and exposure to air during low tides. There are hard bottom flats composed mostly of sand bottoms, and soft-

bottom intertidal flats composed mostly of fine silt and clay particles. Many animals including mud snails, fiddler crabs, square crabs, and hermit crabs are found along intertidal flats of the Chesapeake Bay. Numerous burrowing animals live in the bottoms of intertidal flats, including several species of marine worms (e.g., bristle worms), snails, clams, and shrimp. Wading birds that frequent intertidal flats include dunlins, ibises, oystercatchers, and dowitchers, which feed on the rich epifauna and infauna species found on and within the intertidal flats.

Salt Marshes. Shorelines bordering the Chesapeake Bay often are covered in marshes growing on generally sandy or gravelly soils. Many of these marshes occur on the Chesapeake Bay's eastern and southern shores which tend to be flatter and are inundated by tides twice daily. Salt marshes occur in the Chesapeake Bay as large broad areas and as thin fringe marshes along the Chesapeake Bay shoreline. Salt marshes can be divided into low and high salt marshes which differ in the amount of tidal inundation.

The low marsh occurs in low lying areas flooded twice daily with the tides and are usually dominated by salt marsh cordgrass (*Spartina alterniflora*). Saltmarsh cordgrass often grows in lush stands at the head of tidal creeks, with the most spectacular stands occurring in large, low-lying areas along the Chesapeake Bay that are inundated daily by the tides. Regularly flooded low marshes are havens for young fish and many species of invertebrates.

The high marsh is an irregularly flooded saltmarsh usually only flooded by wind driven tides or exceptionally high tides. These marshes often adjoin low marshes higher up the slope. A typical high marsh in the Chesapeake Bay area is composed of mainly black needlerush (*Juncus roemerianus*), salt meadow hay (*Spartina patens*), and salt grass (*Distichlis spicata*). Two species of shrubs, marsh elder (*Iva frutescens*) and groundsel tree (*Baccharis halimifolia*), often grow on high spots in the high marsh and often occur at the transition from high marsh to upland.

The Chesapeake Bay salt marshes provide crucial habitat for fish, shellfish, waterfowl, shorebirds, wading birds, and several mammals. Several commercially important species including striped bass, menhaden, flounder, oysters, and blue crabs all depend on these wetlands.

Brackish Marsh. Brackish marshes often occur in low flat areas in areas of lower salinity. A typical species found in brackish marshes around the Chesapeake Bay is big cordgrass (*Spartina cynosuroides*), the largest of the three cordgrasses found around the Chesapeake Bay. This species often grows to heights of 10 feet or more. Another grass found in the upper edges of brackish marshes is switchgrass (*Panicum virgatum*). Reedgrass (*Phragmites australis*) is a tall coarse grass that is often found in brackish marshes.

Tidal Freshwater Marsh. Many Chesapeake Bay tributaries have extensive tidal freshwater marshes. These areas are affected by tides, but are far enough from the Chesapeake Bay that the water has no salinity. A typical freshwater marsh may consist of a variety of broad-leaved plants, such as pickerelweed (*Pontedaria*

cordata), arrowhead (*Sagittaria latifolia*), and blue flag (*Iris versicolor*) growing in a wide band in the river. Shoreward of the emergent plants are the rushes (*Juncus* spp.), sedges (*Carex* spp.), mallows (*Kosteletzkia virginica* and *Hibiscus moscheutos*), and cattails (*Typha* spp.). Another tidal freshwater marsh species found around the Chesapeake Bay is wild rice (*Zizania aquatica*) which grows in soft mud and shallow water, sometimes reaching 10 feet in height.

Forested Wetlands. Forested wetlands frequently occupy the upper edge of fresh and brackish marshes. Typical species in bottomland forests include willows (*Salix* spp.), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanicum*), sycamore (*Platanus occidentalis*), and buttonbush (*Cephalanthus occidentalis*).

Submerged Aquatic Vegetation. An important component of the Chesapeake Bay ecosystem is submerged aquatic vegetation. This includes variety of vascular plants that grow entirely under water, forming grassy meadows and weed beds that provide habitat for fish, waterfowl, shellfish, and invertebrates. Sixteen species of submerged aquatic vegetation are commonly found in the Chesapeake Bay or its tributary rivers, with salinity being the primary factor affecting their distribution. Eelgrass and widgeon grass are found in sea grass meadows in higher salinity waters in the lower portions of the Chesapeake Bay. Pondweeds, wild celery, water milfoil, and coontails occur in weed beds along upper Chesapeake Bay shorelines where salinity is lower and in the fresh waters of the Chesapeake Bay's tributaries.

A steady decline in the acreage of submerged aquatic vegetation has occurred in the Chesapeake Bay over the past 30 years. Historically, over 200,000 acres of Chesapeake Bay sea grasses grew along the shoreline. By 1984, the total acreage had decreased to 38,000 acres. Today, it is further diminished. The loss is primarily due to turbidity caused by large populations of phytoplankton (e.g., diatoms and dinoflagellates) growing in response to high concentrations of nutrients in the water. High turbidity caused by dense phytoplankton "blooms" can reduce the amount of light that reaches shallowly submerged photosynthesizing plants. When turbidity becomes severe enough, submerged aquatic plants may not be able to photosynthesize enough to grow or even maintain themselves. As a result, sea grass meadows and weed beds can either become highly reduced in size or slowly die out entirely over time. The primary sources of elevated nutrient levels entering the Chesapeake Bay are runoff from agriculture fields, fertilizer runoff from home garden and lawns, sedimentation and erosion from new development sites, and industrial discharge. Despite the serious loss of submerged aquatic vegetation in the Chesapeake Bay and tributaries, restoration projects where aquatic plants are planted by hand in suitable shallow water habitats are beginning to exhibit some success in reestablishing aquatic plant beds.

4.3.2 Terrestrial Resources

■ Terrestrial Wildlife

The Chesapeake Bay region provides habitat for a wide variety of animals. Important mammals include the white tail deer, black bear, bobcat, red fox, gray fox, gray squirrel, fox squirrel, eastern chipmunk, white-footed mouse, pine vole, short-tail shrew, and common mouse. Common small mammals include raccoons, opossums, rabbits, and numerous species of ground rodents. The turkey, ruffed grouse, bobwhite quail, and mourning dove are the principal game birds. Migratory non-game birds are numerous as are migratory waterfowl. The most abundant breeding birds include the cardinal, tufted titmouse, wood thrush, summer tanager, red-eye vireo, blue gray gnatcatcher, and Carolina wren. Characteristic reptiles include the box turtle, common garter snake, and timber rattlesnake.

■ Terrestrial Vegetation

Riparian Forests. Riparian forests occur in floodplain areas adjacent to streams and rivers where they form the transition between aquatic and the terrestrial environments. The interconnected streams, rivers, and wetlands, and their riparian areas serve as a “circulatory system” for the Chesapeake Bay. Although they compose only 5 to 10 percent of the land in the watershed, riparian areas play an extremely important role in maintaining the health of the Chesapeake Bay. They often act as a buffer area retaining sediments, nutrients, and other contaminants coming from upland runoff, thereby reducing pollutant loads to nearby waters. Typical species found in riparian forests in the area include silver maple, sycamore, butternut hickory, swamp white oak, hop hornbeam, box elder, hackberry, sweet gum, green ash, river birch, and American elm. Pawpaw, poison ivy, wild grape, wild azalea, witch hazel, and spicebush are shrubs and vines often found in these forests.

Upland Forests. In the Chesapeake Bay watershed, wildlife, fish, and plant species compete for land and water resources with approximately 16.7 million people (NPS, 2009). Forests originally covered as much as 95 percent of the Chesapeake Bay watershed. By 1900, less than 50 percent of the watershed was forested. By 2000, 59 percent (about 41.25 million acres) of the watershed was forested (Chesapeake Bay Program Office 2001). Population growth and development constantly threaten the watershed’s forests.

Typical mature upland forests in mesic sites around the Chesapeake Bay are dominated by an overstory of white oaks, beeches, hickories, and tulip poplars. American hornbeam, flowering dogwood, blueberries, shadbush, and viburnums are often present in the understory. A wide variety of insects, amphibians, reptiles, and mammals also make their homes in these forests (Grumet 2000).

Sandier areas, may support a drier type forest which often includes chestnut oak, red oak, flowering dogwood, dwarf chinkapin oak, black jack oak, and Virginia pine as dominants. Blueberries, mountain laurel, and a variety of shrubs and grasses are also often present in these upland xeric habitats.

4.3.3 Threatened, Endangered, and Rare Species

There are approximately 27 federally-listed threatened or endangered species within the Chesapeake Bay watershed along or near the Captain John Smith Chesapeake National Historic Trail (table 4.1). In addition, there are hundreds of state-listed species protected by Maryland, Virginia, and Delaware.

■ Federally Protected Plants Occurring near Shorelines Adjacent to the trail

Ten federally protected plant species are known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. These species are briefly described below. As in Table 4.1, these ten species are listed in alphabetical order by scientific name:

- **Sensitive Joint-vetch** (*Aeschynomene virginica*) – The sensitive joint-vetch typically occurs in freshwater tidal marshes along the mid-Atlantic coast. These marshes exhibit twice daily tides, but occur far enough upstream that they are nearly fresh or brackish in salinity. It grows in the intertidal zone in mucky, sandy, or gravelly bottoms.
- **Sandplain Gerardia** (*Agalinis acuta*) – The sandplain gerardia typically occurs in dry, sandy, short grass plains, roadsides, and openings in oak scrub, along the coastal plain. Soils are typically dry, nutrient poor, and generally acidic and other vegetation is usually sparse and/or stunted.
- **Sea Beach Amaranth** (*Amaranthus pumilus*) – The sea beach amaranth typically occurs on barrier island beaches, where its primary habitat consists of overwash flats at accreting ends of islands as well as lower foredunes and upper strands of non-eroding beaches. It occasionally establishes small temporary populations in other habitats, including bayside beaches, blowouts in foredunes, and sand and shell material placed as beach replenishment or dredge spoil. Sea beach amaranth appears to be intolerant of competition and does not occur on well-vegetated sites.
- **Swamp Pink** (*Helonias bullata*) – The swamp pink typically occurs in a variety of wetland habitats including Atlantic white-cedar swamps, forested wetlands bordering small streams, meadows, and spring seepage areas (NatureServe, 2009).
- **Small Whorled Pogonia** (*Isotria medeoloides*) – The small whorled pogonia typically occurs in semi-open, mesic forests in eastern North America. This species is a small, perennial orchid of deciduous forests, with a gray-green, smooth stem. The small whorled pogonia bears a whorl of 5-6 light green, elliptical, point leaves and 1-2 yellow-green flowers.
- **Canby's Dropwort** (*Oxypolis canbyi*) – The canby's dropwort typically occurs in a variety of different coastal plain habitats including pond cypress savannas, shallows of ponds, sloughs, and wet pine savannas.

Table 4.1. Federally-Listed Species along or near the Captain John Smith Chesapeake National Historic Trail

Scientific Name	Common Name	Status
Plants		
<i>Aeschynomene virginica</i>	Sensitive joint-vetch	Threatened
<i>Agalinis acuta</i>	Sandplain gerardia	Endangered
<i>Amaranthus pumilus</i>	Seabeach amaranth	Threatened
<i>Helonias bullata</i>	Swamp pink	Threatened
<i>Isotria medeoloides</i>	Small whorled pogonia	Threatened
<i>Oxypolis canbyi</i>	Canby's dropwort	Endangered
<i>Ptilimnium nodosum</i>	Harperella	Endangered
<i>Rhus michauxii</i>	Michaux's sumac	Endangered
<i>Schwalbea americana</i>	American Chaffseed	Endangered
<i>Scirpus ancistrochaetus</i>	Northeastern bulrush	Endangered
Mollusks		
<i>Alasmodonta heterodon</i>	Dwarf wedgemussel	Endangered
Insects		
<i>Cicindela dorsalis dorsalis</i>	Northeastern beach tiger beetle	Threatened
<i>Neonympha mitchellii</i>	Mitchell's satyr butterfly	Endangered
<i>Nicrophorus americanus</i>	American burying beetle	Endangered
Fishes		
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	Endangered
<i>Etheostoma sellare</i>	Maryland darter	Endangered
Reptiles		
<i>Caretta caretta</i>	Atlantic loggerhead sea turtle	Threatened
<i>Chelonia mydas</i>	Atlantic green sea turtle	Threatened
<i>Clemmys muhlenbergii</i>	Bog turtle	Threatened
<i>Dermochelys coriacea</i>	Atlantic leatherback sea turtle	Endangered
<i>Eretmochelys imbricata</i>	Atlantic hawksbill sea turtle	Endangered
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle	Endangered
Birds		
<i>Calidris canutus rufa</i>	Red knot	(Candidate)
<i>Charadrius melodus</i>	Piping plover	Threatened
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Protected
<i>Numenius borealis</i>	Eskimo curlew	Endangered
<i>Sterna dougallii</i>	Roseate tern	Endangered
Mammals		
<i>Myotis sodalis</i>	Indiana bat	Endangered
<i>Sciurus niger cinereus</i>	Delmarva fox squirrel	Endangered
Source: U.S. Fish & Wildlife Endangered Species Office, Northeast Region		

- **Harperella** (*Ptilimnium nodosum*) – The harperella typically occurs along rocky shoals of clear swift moving streams and in the coastal plain along the edges of shallow intermittently flooded ponds and wet meadows. To survive, this species requires a narrow range of hydrologic conditions. As a result of the specific habitat requirements, harperella is vulnerable to seemingly minor or major changes in the immediately adjacent or upstream habitats.
- **Chaffseed** (*Schwalbea americana*) – The chaffseed typically occurs in acidic, sandy or peaty soils in open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass and sedge dominated plant communities. This species is parasitic, occurring on the roots of a wide variety of woody and herpeaceous plants. Chaffseed is a perennial herb with mostly unbranched stems and 2-lipped flowers that are yellow, suffused with purple.
- **Northern Bulrush** (*Scirpus ancistrochaetus*) – The northern bulrush typically occurs along the margins of beaver ponds, around the margins of ponds, sand plain depressions, backwater ponds in river floodplains, and boggy marshes. This species is an obligate wetland plant and it appears that sandstone or sand is its preferred substrate, particularly in sites that have fluctuating water levels.
- **Michaux's Sumac** (*Rhus michauxii*) – The michaux's sumac, or false poison sumac, typically occurs in sandy or rocky open woods, highway rights-of way, roadsides, and edges of artificially maintained clearings as well as rights-of-way; often in association with basic to circumneutral soil. This species survives best in areas where some form of disturbance has provided an open area. Michaux's sumac is a shade-intolerant, densely hairy shrub, with a low stature and erect stems which are mostly 0.3 to 0.6 m in height (NatureServe 2009).

■ **Federally Protected Mollusks Known to Occur in Shoreline Areas or in Waters near the trail**

One federally protected mollusk species is known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. This species is briefly described below:

- **Dwarf Wedgemussel** (*Alasmidonta heterodon*) – The dwarf wedge typically occurs in the bottom substrates of running waters of all sizes, from small brooks to large rivers. Bottom substrates include silt, sand and gravel. This species of small freshwater mussel filter-feeds on algae and other suspended particles. Water pollution, including sediments and chemicals from agriculture and other development projects, as well as dams and channelization, are thought to contribute to the mussels decline.

■ **Federally Protected Insects Known to Occur in Shoreline Areas or in Waters near the trail**

Three federally protected insect species are known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. These species are briefly described below. As in Table 4.1, these three species are listed in alphabetical order by scientific name:

- **Northern Beach Tiger Beetle** (*Cicindela dorsalis dorsalis*) – The northern beach tiger beetle typically occurs on wide, sandy beaches, such as those found in Calvert and Somerset Counties in Maryland and on both shorelines of the Chesapeake Bay in Virginia. This species is threatened by habitat alterations associated with shoreline development and shore erosion.
- **Mitchell’s Satyr Butterfly** (*Neonympha mitchellii*) – The mitchell’s satyr butterfly typically occurs in open canopy, bulrush (*Scirpus* spp.) and sedge (*Carex* spp.) dominated boggy seepage wetlands. The decline of this small, brown butterfly species has been attributed to several factors related to habitat loss, including: the destruction due to development, changes in hydrology, invasion by aggressive native (*Typha* spp.) and non-native plant species, and suppression of natural disturbance events important to habitat.
- **Puritan Tiger Beetle** (*Cicindela puritana*) – The puritan tiger beetle typically occurs on the upper portions of sandy beaches near either fresh or salt water. This beetle species feeds on small diptera and amphipods and also scavenges dead crustaceans and fish. Adults emerge in mid-June and begin to decline in late July. As the species has a two or three year life cycle, larvae are present in their burrows at all times. This species is threatened by habitat alterations associated with shoreline development and shore erosion.

■ **Federally Protected Fish Known to Occur in Waters along the trail**

Two federally protected fish species are known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. These species are briefly described below. As in Table 4.1, these two species are listed in alphabetical order by scientific name:

- **Shortnose Sturgeon** (*Acipenser brevirostrum*) – The shortnose sturgeon typically occurs in rivers and estuaries, including the Chesapeake Bay. This species is found in both fast-moving freshwater river systems and offshore marine environments. They are benthic feeders that primarily eat crustaceans and mollusks on the bottom. Threats to sturgeon include development pressure, construction of dams, pollution of river systems, and loss of habitat from discharges and/or dredging.
- **Maryland Darter** (*Etheostoma sellare*) – The only population of maryland darter is known to occur at the mouth of Deer Creek, Maryland. The scarcity of this fish is suspected to relate to its

extremely specialized habitat requirements. Maryland darters thrive only in the part of a stream where the water tumbles out of hills onto a relatively flat coastal plain. The Maryland darter makes its home in the riffles or fast moving areas near the “fall line.” It is believed this species was more widespread, but the influx of sediment, toxics, and nutrients coming from metropolitan areas along the Chesapeake Bay western shore severely degraded the water quality of streams to the extent that this species could no longer survive in these habitats.

■ **Federally Protected Reptiles Known to Occur in Shoreline Areas or in Waters near the trail**

Six federally protected reptile species are known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. These species are briefly described below. As in Table 4.1, these six species are listed in alphabetical order by scientific name:

- **Atlantic Loggerhead Sea Turtle** (*Caretta caretta*) – The loggerhead sea turtle typically occurs in oceans and estuaries around the world, including the Atlantic Ocean. The species spends most of its life in the water but will come ashore to lay eggs. The loggerhead sea turtle largely feeds on bottom dwelling invertebrates.
- **Atlantic Green Sea Turtle** (*Chelonia mydas*) – The green turtle sea typically occurs in oceans and estuaries around the world, including the Atlantic Ocean. The species travels long distances between feeding grounds and nesting beaches. Eggs and hatchlings typically incur high mortality from various terrestrial and aquatic predators.
- **Bog Turtle** (*Clemmys muhlenbergii*) – The bog turtle typically occurs in calcareous fens, sphagnum bogs, and wet, grassy pastures that are characterized by soft, muddy substrates (bottoms) and perennial groundwater seepage. Bog turtle habitats are well-drained and water depth rarely exceeds four inches above the surface. Flora associated with bog turtles includes rushes and sedges, skunk cabbage, cattail, willow, jewelweed, buttonbush, rice-cut grass, arrowhead, and cinnamon fern. Bog turtles are also found in linear drainage ditches.
- **Atlantic Leatherback Sea Turtle** (*Dermochelys coriacea*) – The leatherback sea turtle typically occurs in open ocean, often near edge of continental shelf; also seas, gulfs, bays, and estuaries. The leatherback typically nests on sloping sandy beaches backed up by vegetation. Principal food is jellyfish, though other invertebrates, fishes, and seaweed sometimes are eaten.
- **Atlantic Hawksbill Sea Turtle** (*Eretmochelys imbricate*) – The hawksbill sea turtle typically occurs both in the ocean and in shallow lagoons and coral reefs. This species typically only leaves the

ocean to nest on beaches. The hawksbill typically feeds on invertebrates, such as sea sponges, comb jellies and jellyfish.

- **Kemp's Ridley Sea Turtle** (*Caretta caretta*) – The kemp's ridley sea turtle typically occurs in habitat ranging from open sea to bays, estuaries, lagoons, creeks, and mouths of rivers. Nesting occurs usually on open sandy beaches above high-tide mark, seaward of well-developed dunes. The species typically feeds on various marine invertebrates, plants, and fish (carrion or slow-moving species).

■ **Federally Protected Birds Known to Occur near Shorelines Adjacent to the trail**

Five federally protected bird species are known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. Although no longer on the federal list of endangered and threatened species, the bald eagle is included in this list because it is protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These five species are briefly described below. As in Table 4.1, the species are listed in alphabetical order by scientific name:

- **Red Knot** (*Calidris canutus rufa*) – The red knot is a large sandpiper, which flies more than 9,000 miles from south to north every spring and returns every autumn, making this bird one of the longest-distance migrants in the animal kingdom. One important part of this journey is the availability of billions of horseshoe crab eggs at major North Atlantic staging areas, including the Chesapeake Bay and Cape May peninsula. The increase in taking of horseshoe crabs for bait in commercial fisheries may be a significant factor in the decline in red knots.
- **Piping Plover** (*Charadrius melodus*) – The piping plover typically breeds on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. This species primarily winter on the Atlantic Coast from North Carolina to Florida, although some migrate to the Bahamas and West Indies. Piping plovers return to their breeding grounds in late March or early April. When nesting, pairs typically form a depression in the sand somewhere on the high beach close to the dunes. Surviving young fledge are flying in about 30 days, however, storm tides, predators, or intruding humans sometimes disrupt nests.
- **Bald Eagle** (*Haliaeetus leucocephalus*) – The bald eagle typically occurs near water and favors coasts and lakes where fish are plentiful, and this species will also prey on small mammals. This species uses their talons to fish and prey and also are known to scavenge carrion. Bald eagles are sensitive to human disturbance but sensitivity varies greatly among individual birds. Some nesting pairs are highly tolerant of human presence and will nest in close proximity to developed and recreational areas. Others are intolerant of human presence and are easily flushed off perches or nests if approached, which can interfere with foraging and tending eggs or young in the nest.

- **Eskimo Curlew** (*Numenius borealis*) – The eskimo curlew typically occurs in grasslands, pastures, plowed fields, marshes, and mudflats. The diet of this migratory bird species includes grasshoppers, crickets, grubs and cutworms, ants, moths, spider, freshwater insects, seeds, and beers. The eskimo curlew picks these items from substrate, probes into sand or mud in or near shallow water, or takes prey from the water.
- **Roseate Tern** (*Sterna dougallii*) – The roseate tern typically occurs on coastal beaches in colonies, concealing its nest under grass, driftwood, or other flotsam. Predation by gulls, human disturbance, pollution, and depletion of its prey species are threats to this slender, medium-sized seabird.

■ **Federally Protected Mammals Known to Occur near Shorelines adjacent to the trail**

Two federally protected mammal species are known to occur along the Chesapeake Bay shoreline and adjoining rivers in the vicinity of the trail. These species are briefly described below. As in Table 4.1, these two species are listed in alphabetical order by scientific name:

- **Indiana Bat** (*Myotis sodalis*) – The indiana bat typically occurs in secluded caves or mines while hibernating in the winter, and in the spring this species of small bats disperse, typically occurring in forested habitats along the banks of streams or lakes. This species feeds solely on insects. Potential threats to the indiana bat includes destruction of foraging habitat as well as adverse impacts to hibernation caves.
- **Delmarva Fox Squirrel** (*Sciurus niger cinereus*) – The delmarva fox squirrel typically occurs in mature forest of both hardwood and pine trees, with a minimum amount of understory and ground cover. This species feeds heavily on mast (nuts) primarily oak, hickory, sweetgum, walnut, and loblolly pine; this species also feeds on mature green pine cones. The delmarva fox squirrel appears to prefer making dens in the hollows of trees, but will also build nests of leaves and twigs.

4.4 Cultural Resources

For the purposes of this environmental assessment, cultural resources include four types: archeological resources, historic structures, ethnographic resources, and cultural landscapes. The NPS defines these resource types as described in NPS-28: Cultural resource Management Guidelines:

- **Archeological Resources** are the remains of past human activity and records documenting the scientific analysis of these remains. Archeological resources include stratified layers of household debris and the weathered pages of a field notebook, laboratory records of pollen analysis and museum cases of polychrome pottery. Archeological features are typically buried but may extend above ground; they are commonly associated with prehistoric peoples but may be products of

more contemporary society. What matters most about an archeological resource is its potential to describe and explain human behavior. Archeological resources have shed light on family organization and dietary patterns, they have helped us understand the spread of ideas over time and the development of settlements from place to place.

- **Historic Structures** are material assemblies that extend the limits of human capability. Without them we are restricted to temperate climates, the distances we can walk, and the loads we can carry. With them we can live where we choose, cross the continent in hours, and hurl a spacecraft at the moon. Structures are buildings that keep us warm in winter's worst blizzard and bridges that keep us safe over raging rivers; they are locomotives that carry us over vast prairies and monuments to extend our memories. They are temple mounds and fishing vessels, auto factories and bronze statues—elaborations of our productive ability and artistic sensitivity.
- **Ethnographic Resources** are basic expressions of human culture and the basis for continuity of cultural systems. A cultural system encompasses both the tangible and the intangible. It includes traditional arts and native languages, religious beliefs and subsistence activities. Some of these traditions are supported by ethnographic resources: special places in the natural world, structures with historic associations, and natural materials. An ethnographic resource might be a riverbank used as a Pueblo ceremonial site or a schoolhouse associated with Hispanic education, sea grass needed to make baskets in an African-American tradition or a 19th-century sample of carved ivory from Alaska. Management of ethnographic resources acknowledges that culturally diverse groups have their own ways of viewing the world and a right to maintain their traditions.
- **Cultural Landscapes** are settings we have created in the natural world. They reveal fundamental ties between people and the land—ties based on our need to grow food, give form to our settlements, meet requirements for recreation, and find suitable places to bury our dead. Landscapes are intertwined patterns of things both natural and constructed: plants and fences, watercourses and buildings. They range from formal gardens to cattle ranches, from cemeteries and pilgrimage routes to village squares. They are special places: expressions of human manipulation and adaptation of the land.

4.4.1 Archeological Resources

Much of the Chesapeake Bay is actually a drowned river valley; therefore a significant portion of what is currently underwater was originally dry land. Many prehistoric archeological sites likely remain intact along the bottom of the Chesapeake Bay, and along ancient river terraces. Only recently has underwater archeology begun to assess these hidden resources with new recovery techniques and predictive location models.

However, a wide variety of archeological resources remain on dry land, especially on the broad coastal plain surrounding the Chesapeake Bay. As these lands were often occupied by sedentary agriculturists, and given that these people tended to aggregate into larger settlements with more material remains, the tidewater

areas of the Chesapeake are likely a rich source of archeological resources. Unfortunately, these resources are also in the closest proximity to modern populations and the forces of development, and remain most at risk.

Scholars estimate there are at least 100,000 archeological sites scattered around the Chesapeake Bay with only a small percentage documented. Most are susceptible to a variety of destructive factors, both natural and human caused, which imperil their existence. With development consuming land around the Chesapeake Bay at a rapid pace, undocumented sites may be bulldozed before their valuable information comes to light. When farmers plow their fields, they can inadvertently destroy artifacts from an American Indian tribe. As sea level rises, as it has for many thousands of years, shoreline erosion will continue to destroy many sites.

Recorded history of Chesapeake Bay area American Indians began just prior to 1600 A.D. with the records kept by European explorers and settlers. Captain John Smith found primarily Algonquian-speaking American Indians inhabiting the Chesapeake Bay shores. At the north end of the Chesapeake Bay lived the Susquehannock, most likely of the Iroquois tribe. Many distinct tribes with their own werowance, or chief, lived around the Chesapeake Bay, but they often grouped into larger alliances. The Powhatan paramount chiefdom in Virginia was named for its leader and was one of the more powerful of the period. Despite their strength and savvy, however, the American Indian population in the Chesapeake Bay region dropped catastrophically after the European settlers' arrival due to murder, European diseases and migration.

The archeological resources of the Piedmont areas of the Chesapeake Bay region are less densely-packed than the low lying Coastal Plain, due to the less intensive utilization of these lands over the long haul of prehistory. However, because of the increased slopes in these areas, more damage is expected to the extant archeological record. Many of the prehistoric archeological resources of the Piedmont region pertain to the earliest phases of human occupation, when the subsistence base for these people included wide ranging areas for resource collection and extraction activities. Quarries, hunting camps, and trade routes to other areas outside the region all potentially lie within the Chesapeake Bay's uplands. Many of these sites are widely dispersed, reflecting a generally low prehistoric settlement density. However, with the coming of European settlements, many of these areas are likely to contain a variety of mining, milling, or military sites, in addition to myriad homesteads that have been lost to time.

4.4.2 Historic Structures

The Chesapeake Bay region includes historic structures from a wide variety of temporal periods. For the purposes of this environmental assessment, historic structures are described in three general periods: Colonial, Industrial, and Modern. Each of these periods has ample examples scattered across the several states that make up the watershed. The National Register of Historic Places (NRHP) contains detailed records on hundreds of properties within the area of consideration, and scores more remain either eligible

or potentially eligible for listing on the register. In addition, the Chesapeake Bay area contains a significant number of National Historic Landmarks.

Colonial period structures and sites display the character of the early development of the United States. Numerous examples may be found in the area, ranging from large Historic Districts, such as in Annapolis (ca. 1760s), to private homes, such as Montpelier (ca. 1745) in Prince George's County. Still scattered around the Eastern and Western Shores are several other prime examples of Georgian mansions, formal gardens and grounds, and architectural gems from the late Colonial/early Republic era.

Industrial period structures in the Chesapeake Bay region illustrate many of the important locations in the nation's industrial history, including the B&O Railroad (ca. 1827), the C&O canal (ca. 1815), and the smelting stacks at Principio, Maryland (ca. 1820). Still other locations mark the rise in economic importance of the region, and its major industries located in urban centers, such as Baltimore and Richmond. Similarly, a wide variety of historic houses pertaining to this period are located around the Chesapeake Bay, from palatial estates to humble workers' homes. In many ways, the historic structures and sites of this period are some of the Chesapeake Bay's richest resources.

19th century structures and design have their place in the Chesapeake Bay's cultural heritage as well. Many architects and planners developed new and different approaches in the Chesapeake Bay region. From one of the first master planned American communities, Greenbelt, Maryland, to one of the first enclosed shopping malls such as Wheaton Plaza, many 'modern' individuals set about modifying the Chesapeake landscape.

In sum, the Chesapeake Bay region is endowed with a wide array of historic structures and sites, and the efforts to identify and protect these invaluable resources continue today. While some of these structures are significant as examples of architectural styles or historic eras, others are important because they speak to the history of the Chesapeake Bay as a whole.

4.4.3 Ethnographic Resources

Ethnographic resources are natural and cultural resources that are important in the cultural practices, values, beliefs, heritage and identity of traditionally associated peoples and groups. Such groups may be ethnic and occupational groups, American Indian tribes, and other groups whose traditional cultural practices, values and beliefs connect them with the resources in Chesapeake Bay. These peoples must have been associated with the resource for at least two generations, or forty years, prior to the establishment of the trail. Types of ethnographic resources include objects (such as in museum collections), structures (historic buildings, boats, etc.), sites (such as archeological sites and burial locations), landscape features, and the cultural landscapes within which they are situated. Ethnographic resources may be identifiable from extant features (i.e., gravesites), but they usually require extensive consultation and localized research

efforts to locate and document these properties.

Three main categories of ethnographic resources can be recognized in the Chesapeake Bay region: sites, landscapes, and ethnographically important natural resources. Each of these types of resources relates to different traditionally associated groups including American Indians, African Americans, or traditional watermen, and at different times (e.g., mythical, prehistoric, historic), but they remain important aspects of the shared cultural heritage.

Sites are usually single locations of specific importance to an identifiable group of people. Included in this category would be sacred sites, such as traditional burial grounds, American Indian spiritual locations, or 'lookout points.' Many of these types of ethnographic resources are identifiable from extant features (i.e., graves), but some may require extensive consultation and local research to locate and record these properties.

Ethnographic landscapes include widespread areas for resource acquisition and transport, rock quarrying, or traditional hunting or fishing territories, as well as corridors such as American Indian trails, and routes used by escaping slaves along the Underground Railroad. In many cases, these resources may be claimed and interpreted differently by different and competing groups of people. As cultural resources, however, they remain integral to the Chesapeake Bay's history.

Natural ethnographic resources include seasonally-available anadromous fish, deer, or ripening fruits and flowering plants. While arguably the most difficult to identify and protect, to many American Indians, these resources are integral to defining their traditional existence.

4.4.4 Cultural Landscapes

Cultural landscapes are the combination of cultural and natural factors that structure affiliations between people and places. Important elements of the cultural landscapes found in the Chesapeake Bay region include: historic human settlement and development patterns, evidence of agriculture, evidence of transportation infrastructure, and natural features that affected the human environment. Collectively, landscape patterns and their relationship over time imprint and reflect human history on land and water, and give a geographic area its character. NPS categorizes four general types of cultural landscapes, which are not mutually exclusive: *historic sites*, *historic designed landscapes*, *historic vernacular landscapes*, and *ethnographic landscapes*. The definitions of these types, as described in NPS Preservation Brief #36, are as follows:

- ***Historic designed landscape*** is a landscape that was consciously designed or laid out by a landscape architect, master gardener, architect, or horticulturist according to design principles, or an amateur gardener working in a recognized style or tradition. The landscape may be associated

with a significant person(s), trend, or event in landscape architecture; or illustrate an important development in the theory and practice of landscape architecture. Aesthetic values play a significant role in designed landscapes. Examples include parks, campuses, and estates.

- ***Historic vernacular landscape*** is a landscape that evolved through use by the people whose activities or occupancy shaped that landscape. Through social or cultural attitudes of an individual, family or a community, the landscape reflects the physical, biological, and cultural character of those everyday lives. Function plays a significant role in vernacular landscapes. They can be a single property such as a farm or a collection of properties such as a district of historic farms along a river valley. Examples include rural villages, industrial complexes, and agricultural landscapes.
- ***Historic site*** is a landscape significant for its association with a historic event, activity, or person. Examples include battlefields and president's house properties.
- ***Ethnographic Landscape*** is a landscape containing a variety of natural and cultural resources that associated people define as heritage resources. Examples include contemporary settlements, religious sacred sites and massive geological structures. Small plant communities, animals, subsistence and ceremonial grounds are often components.

As explained further in Appendix Q, Deanna Beacham suggests that the construct of Indigenous Cultural Landscape also be considered, to reflect the contexts of the American Indian peoples in the Chesapeake Bay and their interaction with the landscape. This concept includes both cultural and natural resources and the wildlife therein associated with the historic lifestyle and settlement patterns and exhibiting the cultural or esthetic values of American Indian peoples. While some of these aspects are captured in the definition for an Ethnographic Landscape, the Indigenous Cultural landscape is intended to look at life-ways beyond the associations with sacred sites.

The Chesapeake Bay region includes numerous and overlapping examples of cultural landscapes. One example is found on the Delmarva Peninsula, in landscapes that are associated with the Harriet Tubman Historic Area. There are geographic areas in Dorchester County, MD that serve as excellent examples of 19th century American agriculture, including the association with historic events and activities including the rise of abolitionist thinking, the self-reliance and empowerment of free African Americans, and resistance to the Fugitive Slave Act of 1850. This landscape cannot be assessed as exactly resembling the landscape that existed during the 19th century; however the similarity of flat, open fields and the continuity of marsh and woodlands, as natural barriers evoke the landscape that was the backdrop for these historic events and activities.

Likewise, there are geographic areas along the Chesapeake Bay and tributaries that are reminiscent of the early 17th century. While no such landscape will resemble exactly the landscape that existed during the time of Smith's voyages, marshlands and riparian areas along major tributary rivers can be interpreted to evoke that period. Through the efforts of local, state, and federal agencies, many of areas that contain cultural landscapes that are evocative of the 17th century are conserved. Many more similarly evocative landscapes are unprotected but can provide trail users with an understanding of this resource if they are not encroached upon with further development. Preliminary viewshed analysis has been undertaken to assess the location and integrity of such landscapes in relation to the trail.

4.5 Trail Access

4.5.1 Land Access to the Trail

In proximity to the Captain John Smith Chesapeake National Historic Trail are seven units of the national park system, twelve national wildlife refuges, and three national natural landmarks. The Chesapeake Bay Gateways and Watertrails Network (CBGN), a partnership system of sites, land trails, and water trails, around the Chesapeake Bay watershed, represents a broad cross-section of Chesapeake Bay-related resources. The CBGN includes 170 parks, wildlife refuges, museums, sailing ships, historic communities, and trails. Many of these sites are also currently partners with the trail. Most of the sites are close to the Chesapeake Bay shoreline or one of the tributary rivers.

Figure 4.1 illustrates federal lands and Chesapeake Bay Gateways and Watertrails partners that are in the trail vicinity. Chesapeake Bay Gateways and Watertrails are places to experience Chesapeake Bay life and culture. Each communicates important facets of the Chesapeake story. In addition to the CBGN, there are many state and local parks and more than 760 public access sites that are catalogued through the *Public Access Guide – Chesapeake Bay, Susquehanna River and Tidal Tributaries (Chesapeake Bay Program Office 2009)*. Significant portions of the Chesapeake Bay and tributaries in the trail vicinity are privately owned and not publically accessible for recreational activities.

4.5.2 Water Access to the Trail

The Chesapeake Bay and tributaries are a haven for fishing and for motorized and non-motorized boating. Numerous marinas are located along the waterways to provide boaters with service. Local charter captains offer their expertise to fishermen. Public fishing piers, scenic cruises, and restaurant boats are popular ways to enjoy the Chesapeake Bay and tributaries. Tidal ponds, rivers, and saltwater marshes attract many paddlers. State parks and private campgrounds and outfitters offer canoe and kayak rentals. Private guides are available to assist paddlers in exploring sections of the trail for wildlife and landscape viewing. The Chesapeake Bay's waters are also heavily used for sailing and rowing. Maps are available showing the various parks and public launch sites adjacent to the water and close to the trail route. Significant portions of the Chesapeake Bay and tributaries are not publically accessible for recreational activities.

Current management of the trail aligns partners with the Chesapeake Bay Gateways and Watertrails Network through which technical and financial assistance is available. Many Network sites are situated on or near the Chesapeake Bay and tributaries and offer access to the trail. Trail access includes soft launch sites for paddle craft, launches for motorized boats, guided boat tours on a captained vessel, fishing piers, observation platforms, camping areas, and hiking and biking trails. In FY2010, CBGN financial assistance applicants were invited to seek awards for planning or implementation of new access opportunities for the trail. In FY2011, awards will again focus on new public access development at CBGN sites.

4.6 Visitor Experience

The Chesapeake Bay region has many historic and cultural resources that attract local, regional and national visitors. The District of Columbia, Virginia, and Pennsylvania rank in the top five states for national park unit visitation. The visitation rates at several different types of resources within the Chesapeake Bay Gateways and Watertrails Network (CBGN) serve as a proxy for the tourist activity at state parks, museums, and historic sites. The annual visitation rates vary widely.

Recreational boating is a major activity on the Chesapeake Bay and its tributaries. Maryland currently has over 200,000 registered boats, and it has been estimated that Maryland has over 26,000 transient recreational vessels that use Maryland's waterways on an annual basis. Virginia has 246,000 active boat registrations. Boating activities on the Chesapeake Bay include the use of power, sail, and non-motorized boats (e.g., canoes, kayaks). In addition to recreational boating, sport and commercial fishing by boat are prevalent throughout the Chesapeake Bay and its tributaries.

4.7 Socioeconomic Environment

4.7.1 Land Use and Population

Land use throughout the Chesapeake Bay region varies from highly agrarian to highly developed metropolitan areas of the District of Columbia, Baltimore, and Hampton Roads/Norfolk/Virginia Beach. Only 9.3 percent of the land area in the Chesapeake Bay watershed is intensely developed, with 15.2 percent with commercial development, and 75.5 percent with low intensity development (Multi-Resolution Land Characteristic Consortium). Land cover across the large watershed area has the following breakdown: 3.6 percent developed land, 28.5 percent agriculture, 60.1 percent forested land, 4.3 percent water, 2.6 percent wetland, and 0.9 percent barren (Chesapeake Bay Special Resource Study, August 2004). Approximately 16.7 million people live in the Chesapeake Bay watershed; about 10 million people live along or near its shores. By 2020, it is expected that nearly 18 million people will live in the region (Chesapeake Bay Special Resource Study, August 2004).

Eight smaller watersheds compose the Chesapeake Bay watershed. These include the Susquehanna River, Patuxent River, Rappahannock River, James River, York River, Potomac River, the Eastern Shore, and the Maryland Western Shore.

The upper section of the Chesapeake Bay includes the Susquehanna and Maryland Western Shore watersheds. Along the Chesapeake Bay these areas are industrial and commercial, encompassing the cities of Annapolis, Baltimore, and Havre de Grace, Maryland. The southern portion of the Maryland Western Shore Watershed consists mostly of forest and agricultural land. Directly along the Chesapeake Bay, these areas have a well developed infrastructure of roads and are heavily populated. This area showed an increase in population from 1990 to 2000, and projections anticipate a continual increase in population through the year 2020.

The middle sections of the Chesapeake Bay consist of the Eastern Shore, Patuxent River, and Potomac River Watersheds. These areas primarily consist of forested and agricultural lands. Developed areas occur sporadically in these areas along the Bay. There is a well developed road system. Populations are generally denser than in other areas. Population increased from 1990 to 2000 and projections anticipate a continual increase in population through 2020. Populated areas in the middle section include Prince Georges, Anne Arundel, and Montgomery Counties, Maryland; the District of Columbia; and Arlington, Alexandria, and Fairfax Counties, Virginia.

The lower section of the Chesapeake Bay includes the watersheds of the York River, Rappahannock River, and James River. The area within these watersheds is mostly forest and agricultural land, with some residential and commercial development interspersed. Populations in this section are lower than in other areas of the Chesapeake Bay. There was an increase in population from 1990 to 2000, and it is anticipated that there will be a continual increase in population through the year 2020. Road infrastructure is not as widespread in this section with the exception of the area around Norfolk which is a highly developed and densely populated area.

4.7.2 Economy

The economic mainstays of the Chesapeake Bay region since the late 1800s have been ports with their import and export trade, the seafood industry, tourism, the military, and shipbuilding and repair. Major ports along the Chesapeake Bay include Baltimore, and Norfolk.

The seafood industry remains a major factor in the economic life of the Chesapeake Bay. More than 500 million pounds of seafood are harvested from the Chesapeake Bay annually. The Chesapeake Bay is the largest producer of blue crabs in the United States. More than one-third of the blue crabs harvested in the U.S. come from the Chesapeake Bay. The long-term outlook for the seafood industry is in question, however, as over-fishing and pollution in the Chesapeake Bay is causing a decrease in marine life. Oyster

populations have declined dramatically, with harvests only about one percent of what it was at the end of the 19th century. This is primarily due to over-harvesting, pollution, and disease.

Agriculture plays an important part in the economy of the Chesapeake Bay Watershed. In Virginia, over the past 40 years, farm production has increased by 63 percent, while agricultural land has decreased 47 percent, and farm related labor has decreased 89 percent. Production of broiler chickens is the state's leading agricultural commodity, followed by milk, cattle, turkeys, tobacco, nursery plants, soybeans, eggs, winter wheat, cotton, and corn.

Tourism continues to play a key role in the economy of the Chesapeake Bay region. Visitors come to the area from all over the United States and from other countries. Attracted by the water, beaches, and shores around the Bay, these visitors also visit historic sites and museums in the region. In 2001 visitors to Maryland spent almost \$7.7 billion on goods and services, generated 646 million in tax revenue, and indirectly provided more than 103,000 jobs. In Virginia, 275 historic attractions host more than 6.5 million annual visits.

The military is another major stimulus in the economy of the Chesapeake Bay region. A number of military bases border the Chesapeake Bay and tributaries. At the mouth of the Chesapeake Bay, Norfolk Naval Base contributes significantly to the economy in the tidewater area. Other bases on the Chesapeake Bay include the Aberdeen Proving Grounds near the north end of the Chesapeake Bay and Langley Air Force Base near the south end. Nearly a third of the region's jobs are with the Department of Defense or a defense contractor. Norfolk is the U.S. Navy's largest naval base and Portsmouth is home to the world's biggest shipyard.

The ports and waterways of the Chesapeake Bay have considerable levels of ocean crossing commercial ship traffic associated with the world economy. Approximately ninety million tons of imports and exports pass through the major ports of Baltimore and Hampton Roads each year.

4.8 Trail Administration and Management

The public and private resources that contribute to the significance of the proposed trail are currently under a variety of management and ownership. While there are numerous publically owned and/or publicly accessible lands and resources along the trail, no singular entity coordinates the interpretation and protection of resources related to the trail. Many local and state governments, tourism agencies, and non-profits have indicated an interest in building connections to the trail in a variety of ways, from commemorative events and other tourism-related activities, to interpreting the stories and preserving the resources related to the trail. Individual resource sites have maintenance, security, and resource protection measures in place.



CHAPTER 5 ENVIRONMENTAL CONSEQUENCES

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5.0 Environmental Consequences

5.1 Introduction

This section of the CMP describes the potential environmental and socioeconomic consequences of implementing the no-action and action alternatives presented in Chapter 3. The overall methodology for assessing impacts is presented below. It is organized by resource topic, and provides a standardized comparison between alternatives based on the most relevant impact topics described in Chapter 1. Impacts are described in terms of context, intensity, duration, and cumulative impacts. NPS policy also requires that impairment of resources be evaluated in all environmental documents.

Comprehensive management plans are programmatic, long-range documents and the actions described in the alternatives are often general in nature and not necessarily site specific. The general nature of the alternatives dictates that the analysis of impacts is also general. Consequently, the impacts of these actions are analyzed in qualitative rather than quantitative terms. Thus, although the NPS can make reasonable projections of likely impacts, the environmental assessment (EA) presents an overview of potential impacts relating to each alternative. As subsequent development or management actions are implemented under the approved CMP, additional site-specific studies and evaluations in accordance with NEPA and other applicable compliance requirements will be done. Chapter 6.0 of this CMP/EA, Consultation and Coordination, includes a summary chart of potential activities requiring compliance with NEPA and Section 106 of the *National Historic Preservation Act of 1966*, for Alternative 3 (the preferred alternative).

The existing conditions for all of the impact topics that are analyzed are identified in Chapter 4. All of the impacts are assessed in relation to each of the alternatives. For each dismissed impact topic there is a description of the beneficial and adverse effects, followed by a brief conclusion.

5.1.1 Methods and Assumptions

Overall, the impact analysis and conclusions are based on the review of the existing literature, information provided by on-site experts and other agencies, professional judgment, knowledge and insight. As required by NEPA, potential impacts are described in terms of type, context, duration, and level of intensity. These terms are defined below.

5.1.2 Definitions

The following are definitions of terms that are used in this chapter when determining the environmental consequences of the actions in each alternative. The environmental consequences to each impact topic are defined based on impact type, intensity, duration, and whether the impact would be direct or indirect. Cumulative impacts are also defined in this section.

- **Impact Type**

Impacts can be beneficial or adverse. Beneficial impacts would improve resource conditions while adverse impacts would deplete or negatively alter resources.

- **Intensity**

Impact intensity is the degree to which a resource would be adversely affected. The level of intensity definitions (negligible, minor, moderate, or major) varies according to each resource, therefore separate definitions are provided for each impact topic analyzed. Beneficial impacts are those that involve positive change in condition or appearance of the resource or a change that moves that resource toward a desired condition. Due to the programmatic nature of this CMP most impact intensities are expressed qualitatively.

- **Duration**

Duration is a measure of the time period over which the effects of an impact persist. The duration of impacts can be described as either short term or long term. The scope of this CMP is 20 years. Within this timeframe, impacts that would occur within five years or less are classified as short-term effects. Long-term effects would last for more than five years. Depending on the resource, if an impact is associated with new construction, a short-term impact would be associated with the construction period and the five years that follow.

- **Direct and Indirect Impacts**

NPS Director's Order #12, Conservation Planning, Environmental Impact Analysis, and Decision-Making (DO-12) and accompanying DO-12 Handbook (NPS 2001) require that direct and indirect impacts be considered, but not specifically identified. A direct impact is caused by an action and occurs at the same time and place. An indirect impact is caused by an action later in time, but still reasonably foreseeable and farther removed in distance.

- **Cumulative Impacts**

The Council on Environmental Quality (CEQ) regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all four alternatives.

Cumulative impacts were considered for each alternative for all impacts. These impacts were determined by combining the impacts of the alternatives with the impacts of other past, present, and reasonably

foreseeable future actions. The geographic area of interest for the cumulative impact analysis varied, depending on the impact topic.

In defining the contribution of each alternative to cumulative impacts, the following terminology is used:

- **Imperceptible.** The incremental effect contributed by the alternative to overall cumulative impacts is such a small increment that it is impossible or extremely difficult to discern.
- **Noticeable.** The incremental effect contributed by the alternative, while evident and observable, is still relatively small in proportion to the overall cumulative impacts.
- **Appreciable.** The incremental effect contributed by the alternative constitutes a large portion of the overall cumulative impact. Because some of these actions are in the early planning stages, the evaluation of the cumulative impact is based on a general description of the project. The cumulative impact is considered for all alternatives and is presented at the end of each impact topic discussion.

5.1.3 Mitigation Measures

As subsequent development or management actions are implemented under the approved CMP, additional site-specific studies and evaluations, including mitigation measures in accordance with NEPA and other applicable compliance requirements will be done. The plan outlines management actions analyzed as beneficial including conservation and stewardship education, volunteer cleanup, and habitat restorations. Mitigation measures would be taken during the implementation of all the alternatives. All impacts are assessed assuming that mitigating measures have already been implemented.

5.2 Impact Topics Considered But Dismissed

Sixteen issues were considered not likely to be affected by the project due to the location and/or programmatic nature of the proposed National Historic Trail. During scoping, Interdisciplinary team members evaluated the following impact topics and dismissed these topics as described below.

The existing conditions for all of the impact topics that are analyzed are identified in Chapter 4. All of the impacts are assessed in relation to each of the alternatives. For each dismissed impact topic there is a description of the beneficial and adverse effects, followed by a brief conclusion.

5.2.1 Compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), and the Fish and Wildlife Coordination Act

Comprehensive planning does not require compliance with the above executive orders or the Fish and Wildlife Coordination Act. As subsequent development or management actions are implemented under the approved CMP, additional site-specific studies and evaluations in accordance with NEPA and other

applicable compliance requirements will be done. Therefore, this issue was dismissed from further consideration.

5.2.2 Exotic/Non-Native Species

The NHT would not likely to increase the spread of non-native species around the Chesapeake Bay. Mutual conservation agreements would manage for exotic/non-native species. Therefore, this issue was dropped from further review.

5.2.3 Soils

Any new partner sites (e.g., new resource sites or new access sites) would come under partnership conservation agreements which would use best management practices to avoid sedimentation/erosion from entering the Chesapeake Bay. Use of harmful residual chemicals which may be retained in the soil and be toxic to soil microfauna would be discouraged. Therefore, soils would not be discussed further in this document.

5.2.4 Air Quality

Air quality would be temporarily impacted during any construction equipment associated with new resource sites and/or new access sites (e.g., clearing and grading). However, this is likely to be of short duration and only during and immediately after using equipment. Therefore, air quality would not be further discussed in this document.

5.2.5 Soundscapes

Some noise impacts would occur with increased use of currently quiet waterways by both motorized and non-motorized watercraft. However, visitors and residents of the Chesapeake Bay are accustomed to some noise from recreational boating and the changes in boating patterns by trail users is likely to result in negligible short-term impacts on the soundscapes on and near the trail. Therefore, this topic would not be discussed further in this document.

5.2.6 Stream flows

None of the proposed alternatives in this CMP are expected to have a measurable impact on stream flows. Therefore, stream flows will not be discussed further in this document.

5.2.7 Land Use

Purchase in fee of any new resource sites or new access sites by partners or the NPS, as referenced in this plan, would be minimal relative to the scope of the trail. Therefore management acts associated with this plan would have only minimal impacts on land use. Therefore, this topic would not be discussed further in this document.

5.2.8 Vegetation

Implementation of any of the alternatives proposed in this study would likely have no substantial impact native vegetation. Impacts to native vegetation would be considered in selecting new access sites. As subsequent development or management actions are implemented under the approved CMP, additional site-specific studies and evaluations in accordance with NEPA and other applicable compliance requirements will be done. Therefore, this topic would not be considered further in this document.

5.2.9 Energy Resources

Use of automobiles or gas powered boats by trail users or construction projects would require gasoline or other energy resources. Analysis indicates that the amount increased energy use because of the proposed management actions is considered negligible. Therefore, energy resources were not considered further in this document.

5.2.10 Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their planning documents by identifying and addressing disproportionate high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities. The trail is proximate to a large expanse of urban communities including the Washington D.C.-Baltimore, Maryland-Richmond, Virginia urban corridor and has minority and low-income populations. The proposals in this CMP would not have disproportionately high or adverse impacts on minorities and low-income populations and communities; therefore, this issue is not considered further in this document.

5.2.11 Tribal Land Use Plans or Policies

The proposed alternatives would not likely impact any tribal land use plans or policies. The alternatives in this CMP would not likely impact existing access to and ceremonial use of Indian sacred sites or adversely impact the physical integrity of any sacred sites. As subsequent development or management actions are implemented under the approved CMP, additional consultations and evaluations with tribes will be done. Therefore, this issue was not considered further in this document.

5.2.12 Indian Trust Lands and Resources

In general, Indian Trust resources are related to federal land that is held in trust for a federally recognized tribe. In that situation, the federal government, represented by the Bureau of Indian Affairs in the Department of the Interior, has an obligation to protect resources such as oil, gas and timber or the income derived from selling or leasing such resources on behalf of a tribe. There are no federally recognized tribes in the study area and no lands held in trust on behalf of any federally recognized Indian tribe on or proximate to the trail, therefore this impact topic was considered by not addressed further in this document.

5.2.13 Prime and Unique Agricultural Lands

The NHT is primarily a water trail, and any potential access sites would be removed from consideration if they have been designated as prime and unique agriculture lands around the Chesapeake Bay. Therefore, this issue was not considered further in this document.

5.2.14 Visitor Safety

The Captain John Smith Chesapeake NHT does not own or manage land or trail waters, and therefore, must depend upon its partners to be vigilant in ensuring the visitor with a safe environment whether they are at a land-based site or traveling the water routes of the trail. The NPS would, in cooperation with partners provide safety information in brochures and on web sites. Visitors would be encouraged to follow the “rules of the road” and adhere to the laws and policies of the jurisdictions in which they travel. This issue was not considered further in this document.

5.2.15 Climate Change

Climate change refers to any significant changes in average climatic conditions (such as mean temperature, precipitation, or wind) or variability (such as seasonality, storm frequency, etc.) lasting for an extended period (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change provide clear evidence that the climate change is occurring and would accelerate in the coming decades. There is strong evidence that global climate change is being driven by human activities worldwide, primarily the burning of fossil fuels and tropical deforestation. These activities release carbon dioxide and other heat-trapping gases, commonly called “greenhouse gases”, into the atmosphere.

There are two aspects of climate change that must be considered in an environmental impact analysis:

- The impact of climate change on the trail. In other words, how the resources managed in these alternatives are likely to change in response to changing climate conditions, and how does that change or otherwise affect our management actions and the impacts of those actions on the resource. For example, potential impacts from sea level rises in response to climate change would likely have cumulative impacts on shoreline vegetation and possibly on submerged aquatic vegetation.
- Trail impacts on climate change (i.e., through our actions, the potential to increase or decrease emissions of greenhouse gases that contribute to climate change).

The actions proposed in any of the alternatives would not result in more than a negligible increase in greenhouse gas emissions. There would be some increase in traffic associated with increased visitation to the trail; however, this additional vehicular travel is not expected to result in more than a negligible increase in the current amount of vehicular traffic, and associated greenhouse gas emissions, in the park or the region. In addition, motorized boats using the trail would contribute to emissions, although the overall

motorized boat traffic in Chesapeake Bay waters are not anticipated to increase due to the trail. The NPS is committed to incorporating energy efficiency and reduction in greenhouse gas emissions for park operations. Management actions in all CMP alternatives would comply with NPS sustainable energy design and energy management requirements. Any facility development, whether it is a new building, a renovation, or an adaptive reuse of an existing facility, must include improvements in energy efficiency and reduction in greenhouse gas emissions. All projects that include visitor services facilities must incorporate Leadership in Energy and Environmental Design (LEED) standards and strive to achieve the highest LEED certification possible.

The full extent of climate change impacts to resources and visitor experience is not known, nor do managers and policy makers agree on the most effective response mechanisms for adapting to climate change. All of the CMP alternatives include a number of management actions that the NPS would implement to respond to the climate change challenge. As more specific information on climate change response becomes available, the trail will incorporate climate change considerations into future management actions and carry out any necessary compliance processes, as appropriate. Therefore, the impacts of climate change on this CMP were dismissed from further analysis in this document.

5.2.16 Museum Collections

The trail and trail administration currently has no curatorial responsibility of any specimens, objects, or manuscript and archival collections, therefore this impact topic was dismissed. If trail administration or trail partners acquire any specimens, objects, or other collections requiring curatorial responsibility in the future, administrators will curate the collections following NPS standards and procedures as described in Director's Order #24, NPS Museum Collections Management (DO-24) and in the accompanying NPS Museum Handbook (NPS 2008).

5.3 Impacts on Natural Resources

5.3.1 Aquatic Resources

■ Methodology

In this EA, impacts on aquatic resources are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

Any activity related to trail management or use that reduces the survival of aquatic plant and/or animal species or reduces the natural function or appearance of habitat areas would be considered an adverse impact. The impacts assessment for aquatic resources was conducted in accordance with NPS 77: Natural Resource Management Guidelines, NPS Management Policies 2006; Director's Order 2: Planning; and NPS

Director's Order 12: Environmental Impact Analysis (2001). These documents provide general guidance for compliance with environmental laws, executive orders, and other regulations, including the National Environmental Policy Act of 1969 (NEPA), the Endangered Species Act, the Clean Air Act, the Clean Water Act, Executive Order 11988 (Floodplain Management), and Executive Order 11990 (Protection of Wetlands).

Table 5.1 presents the impact intensity definitions used for purposes of analyzing potential impacts on terrestrial resources.

Table 5.1 Impact Intensity Definitions – Aquatic Resources

Impact Topic	Negligible	Minor	Moderate	Major
Aquatic Resources	Management actions would result in impacts on aquatic resources that would not be detectable or would be at the lowest level of detection. The abundance, distribution of individuals, or extent of fragmenting features would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.	Adverse impact – Management actions would result in a detectable change in aquatic resources, but the change would be slight and have only a local effect on the resources. This would include changes in the abundance, distribution, fragmenting features, or composition of individual species in a local area, but not include changes that would affect the viability of local or regional populations or communities. Changes to local ecological processes would be minimal.	Adverse impact – Management actions would result in a clearly detectable change in aquatic resources that could have an appreciable adverse effect on the community. This could include changes to a local population sufficient to cause a change in the abundance, distribution, fragmenting features, or composition of local aquatic resources, but not changes that would affect the viability of regional populations or communities. Changes to local ecological processes would be of limited extent.	Adverse impact – Management actions would result in a clearly detectable change in aquatic resources that could have severely adverse effect on the community. The impacts would be substantial and highly noticeable and could result in widespread change. This could include changes in the abundance, fragmenting features, distribution, or composition of local aquatic resources or regional aquatic resources to the extent that it would not be likely to recover. Considerable ecological processes would be altered, and changes would be expected.
		Beneficial impact – Management actions would restore or preserve aquatic resources in some areas on and near the trail.	Beneficial impact – Management actions would restore or preserve aquatic resources in many areas on and near the trail.	Beneficial impact – Management actions would restore or preserve aquatic resources throughout much of areas on and near the trail.

■ Impacts on Aquatic Resources – Alternative 1 (Continuation of Current Management)

Surface Waters and Water Quality Impacts. In Alternative 1, trail partners would continue to manage sites in ways that improve watershed health and promote conservation stewardship of the Bay's related natural resources in accordance with signed MOU agreements between the partner and NPS. Efforts by partners to improve water quality would likely have negligible to minor long-term beneficial impacts on water quality based on active management practices to prevent sedimentation, toxicants, and/or nutrients from entering adjacent waterways. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Fish and Other Aquatic Life. For the Alternative 1, trail partners would continue to promote conservation stewardship of Chesapeake Bay-related natural resources in accordance with agreements described in the trail MOU. Efforts by partners to improve the water quality of the Chesapeake Bay and other waterways would also likely improve conditions for fish and aquatic life in nearby waters. Overall, efforts at water quality improvements at partner-sites along the trail would likely have negligible to minor long-term beneficial impacts on nearby fish and aquatic species.

Aquatic Vegetation. Aquatic vegetation of the Chesapeake Bay and tributaries includes freshwater wetlands, salt marshes, as well as submerged aquatic vegetation (SAVs). These vegetation communities are benefiting from conservation efforts currently in place at partner sites along the trail. Impacts efforts on aquatic vegetation at partner-sites along the trail would likely have negligible to minor long-term beneficial impacts.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term beneficial impacts on aquatic resources. These impacts could be expected due to the NPS and trail partners continuing to promote conservation stewardship of Chesapeake Bay-related natural resources in accordance with agreements described in the trail MOU. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Cumulative Impacts on Aquatic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to aquatic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat or water quality in the Chesapeake Bay and tributaries. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic areas that abut developed land. Reasonably foreseeable actions that would have impacts on aquatic resources would be subject to local regulations requiring storm water management, erosion and sedimentation control and replanting with native species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on aquatic resources, although impacts would continue to occur at a reduced level. The impact of Alternatives 1, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on aquatic resources. Alternative 1 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Aquatic Resources – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Surface Waters and Water Quality Impacts. In Alternative 2, NPS would participate in protection of significant Smith voyage stops by providing technical assistance to partners. Assistance would likely involve educating landowners and property managers regarding best management practices to reduce levels of

sedimentation and runoff entering surface waters. Alternative 2 could recommend measures to minimize negative impacts of water sedimentation and runoff through stewardship efforts, interpretive signs, use restrictions, and other monitoring. With appropriate management measures in place, surface water quality could benefit from greater protection as visitors are directed to appropriate trail areas and restricted from accessing fragile resource areas and ecosystems. Alternative 2 would likely have minor long-term beneficial impacts on surface waters and water quality.

Implementation of Alternative 2 could also cause potential adverse impacts to surface water quality. Changing traffic patterns and increasing levels of visitor use and activity could have an adverse impact on the aquatic resources in the area. Increased motorized boating along the trail could result in more fuel and motor emissions getting into surface waters through improved access to the trail. Overall, implementation of Alternative 2 is more likely to alter patterns of boating on the Chesapeake Bay, but not greatly increase the overall number of motorized boats. For the entire Chesapeake Bay and tributaries, impacts to surface water quality from increased visitor use and/or increased motor emissions from visitors using the trail is likely to be negligible because better management practices and education would likely minimize damages to shoreline areas, and a large increase in motor boat emissions is not anticipated.

Fish and Other Aquatic Life. In Alternative 2, conservation education would likely benefit fish and other aquatic species by reducing sedimentation and overland nutrient and toxicant flow into the Chesapeake Bay and tributaries, reducing phytoplankton spikes, less siltation, and better light quality in SAV habitats. Any improvements to surface water quality through protection, better management practices, education, restricted visitation in sensitive areas, and/or acquisition of new access at partner sites would likely have minor long-term beneficial impacts to fish and other aquatic species.

Aquatic Vegetation. Increased visitor traffic at partner-owned resource sites could adversely impact shoreline vegetation through trampling and/or boat traffic at launch sites. However, active management and/or protection and education at these sites would likely offset adverse impacts on aquatic habitats (e.g., salt marshes) and may reduce or eliminate adverse impacts at other sites.

Overall, implementation of Alternative 2 would likely have minor long-term beneficial impacts on aquatic resources due to efforts to encourage partners and properties managers to follow best management practices, conservation and stewardship education, and negligible impacts from visitor use. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Cumulative Impacts on Aquatic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to aquatic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat or water quality in the Chesapeake Bay and tributaries. Fragmentation, non-native

species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic areas that abut developed land. Reasonably foreseeable actions that would have impacts on aquatic resources would be subject to local regulations requiring storm water management, erosion and sedimentation control and replanting with native species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on aquatic resources, although impacts would continue to occur at a reduced level. The impact of Alternatives 2, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on aquatic resources. Alternative 2 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Aquatic Resources – Alternative 3 (Chesapeake Region in the 17th Century)**

In Alternative 3, funding is proposed to assist partners in acquiring new significant landing sites for the John Smith voyages, to protect important viewsheds, natural landscapes, archeological sites, and places significant to American Indians. Two regional interpretive centers could be established using existing buildings.

Surface Waters and Water Quality Impacts. The benefits to the Chesapeake Bay's water quality at partner sites and resulting from NPS technical assistance with protection, management, planning, and new acquisitions described in Alternative 2 also apply to Alternative 3. In Alternative 3, NPS may be able to assist partners in purchasing significant non-threatened sites along the trail. In the absence of interested partners, NPS may be able to acquire significant threatened or non-threatened properties from willing sellers. The ability to purchase non-threatened properties proposed in Alternative 3 combined with the benefits mentioned above would likely result in the moderate long-term beneficial impacts to water quality.

Fish and other Aquatic Life. Improvements to surface water quality through protection following new acquisitions, better management practices, landowner education, and restricted visitation to sensitive areas, would likely benefit fish and other aquatic species. Reducing sedimentation and overland nutrient and/or toxicant flow into the Chesapeake Bay could result in minor long-term beneficial impacts on fish and aquatic species by minimizing potential phytoplankton spikes, reducing the potential for excessive siltation covering fish eggs (e.g. trout) or non-mobile benthic species (e.g., oysters), and avoidance of potential impacts to SAVs through maintenance of better light quality.

Aquatic Vegetation. All benefits to aquatic vegetation from active conservation management at partner sites described for Alternative 2 also apply to Alternative 3. In addition, more properties are likely to come under protection via trail MOU guidelines and/or ownership by NPS or NPS partners in Alternative 3 because funding for acquisitions can include threatened and/or non-threatened resource sites would likely have minor to moderate long-term beneficial impacts on aquatic vegetation.

Added acquisitions, protection, and management of resource sites proposed in Alternative 3 could have adverse impacts as well as beneficial impacts on shoreline and aquatic vegetation communities. Increased visitor traffic at new resource sites could adversely impact shoreline vegetation through trampling and or boat traffic at launch sites. However, most of these impacts can be minimized by active management and/or protection of these sites through restricting use in sensitive areas and/or decreasing development in these habitat types.

Overall, implementation of Alternative 3 would likely have moderate long-term beneficial impacts on shoreline and aquatic vegetation. These impacts could be a result of the potential acquisition and management of sites along the trail, expanded management assistance for existing sites, and conservation education efforts. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Cumulative Impacts on Aquatic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to aquatic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat or water quality in the Chesapeake Bay and tributaries. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic areas that abut developed land. Reasonably foreseeable actions that would have impacts on aquatic resources would be subject to local regulations requiring storm water management, erosion and sedimentation control and replanting with native species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on aquatic resources, although impacts would continue to occur at a reduced level. The impact of Alternatives 3, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on aquatic resources. Alternative 3 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Aquatic Resources –Alternative 4 (Recreation on the Historic Trail)**

Alternative 4 focuses on recreational activities and volunteer environmental programs, emphasizing that a healthy Chesapeake Bay is a more enjoyable resource. Some important components of Alternative 4 include: Chesapeake Bay and tributaries volunteer cleanup programs, invasive species eradications, habitat restoration, and wildlife monitoring.

Surface Waters and Water Quality Impacts. The benefit to the Chesapeake Bay's water quality at partner sites, from NPS providing technical assistance with protection, management, planning, and from new acquisitions of threatened resource sites described in Alternative 2 also apply to Alternative 4. In addition, volunteer cleanup programs and habitat restoration projects would benefit water quality by removing

potential toxicants (i.e., trash) from shorelines. Restored shoreline habitats can provide additional sediment, toxicant, and nutrient retention areas that reduce the amounts of these substances entering the Chesapeake Bay and tributaries. Overall, Alternative 4 is likely to encourage the greatest amount of environmental ethics to volunteers participating in projects and could result in moderate long-term beneficial impacts on surface waters and water quality impacts.

Fish and Other Aquatic Life. Improvements to surface water quality through protection, better management practices, education, restricted visitation in sensitive areas, and new acquisitions would have benefits to fish and other aquatic species. Reducing sedimentation and overland nutrient and toxicant flow into the Chesapeake Bay and tributaries would provide minor long-term beneficial impacts to fish and aquatic species by minimizing potential phytoplankton spikes, minimizing reductions in dissolved oxygen levels from elevated nutrient levels, reducing the potential for excessive siltation covering fish eggs (e.g., trout) or non-mobile benthic species (e.g., oysters), and by avoidance of potential impacts to SAVs through maintenance of better light quality. The addition of volunteer cleanup programs and habitat restoration projects would further benefit fish and aquatic invertebrates through the beneficial impacts on water quality and potential nursery habitats.

Aquatic Vegetation. Added protection and management of resource sites proposed in Alternative 4 could have both adverse impacts as well as beneficial impacts on shoreline and aquatic vegetation communities. Increased visitor traffic at new resource sites could adversely impact shoreline vegetation through trampling and or boat traffic at launch sites. These impacts can be minimized by active management and/or protection by restricting use and/or decreasing development in sensitive habitat areas. Habitat restoration projects could expand the area of freshwater wetlands, salt marshes, or SAVs in the Chesapeake Bay and tributaries. The increase in visitation combined with active management of sites to protect shorelines would likely result in minor long-term beneficial impacts on aquatic vegetation.

Overall, implementation of Alternative 4 would likely have minor long-term beneficial impacts on aquatic resources along and adjacent to the trail based in particular on some enhanced protection at new acquisition sites, active conservation management, conservation education, and proposed habitat restoration.

Cumulative Impacts on Aquatic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to aquatic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat or water quality in the Chesapeake Bay and tributaries. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic areas that abut developed

land. Reasonably foreseeable actions that would have impacts on aquatic resources would be subject to local regulations requiring storm water management, erosion and sedimentation control and replanting with native species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on aquatic resources, although impacts would continue to occur at a reduced level. The impact of Alternatives 4, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on aquatic resources. Alternative 4 would contribute an imperceptible impact to the total cumulative impacts.

■ **Conclusion – Impacts on Aquatic Resources**

Alternative 1 would likely result in negligible to minor long-term beneficial impacts on aquatic resources. This would result from NPS and trail partners continuing to promote conservation stewardship of Chesapeake Bay-related natural resources in accordance with agreements described in the trail MOU. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Alternative 2 would likely result in minor long-term beneficial impacts on aquatic resources resulting from efforts to encourage partners and properties managers to follow best management practices, conservation and stewardship education, and negligible impacts from visitor use. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Alternative 3 would likely result in moderate long-term beneficial impacts on shoreline and aquatic vegetation. This would result from the potential acquisition of significant sites by NPS or NPS partners, enhanced protection and management at new acquisition sites, active conservation management and education at all sites, and proposed habitat restoration. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

Alternative 4 would likely result in minor long-term beneficial impacts on aquatic resources along and adjacent to the trail based on some enhanced protection at new acquisition sites, active management, and education, and proposed habitat restoration. Long-term adverse impacts on aquatic resources due to an increase in trail users would likely be negligible.

5.3.2 Terrestrial Resources

■ **Methodology**

In this EA, impacts on terrestrial resources are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

Any activity related to trail management or use that reduces the survival of terrestrial plant and/or animal species or reduces the natural function or appearance of habitat areas would be considered an adverse impact. The impacts assessment for terrestrial resources was conducted in accordance with NPS 77: Natural Resource Management Guidelines, NPS Management Policies; Director's Order 2: Planning; and NPS Director's Order 12: Environmental Impact Analysis (2001). These documents provide general guidance for compliance with environmental laws, executive orders, and other regulations, including the National Environmental Policy Act of 1969 (NEPA), the Endangered Species Act, the Clean Air Act, the Clean Water Act, Executive Order 11988 (Floodplain Management), and Executive Order 11990 (Protection of Wetlands).

Table 5.2 presents the impact intensity definitions used for purposes of analyzing potential impacts on terrestrial resources.

Table 5.2 Impact Intensity Definitions – Terrestrial Resources

Impact Topic	Negligible	Minor	Moderate	Major
Terrestrial Resources	Management actions would result in impacts on terrestrial resources that would not be detectable or would be at the lowest level of detection. The abundance, distribution of individuals, or extent of fragmenting features would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.	Adverse impact – Management actions would result in a detectable change in terrestrial resources, but the change would be slight and have only a local effect on the resources. This would include changes in the abundance, distribution, fragmenting features, or composition of individual species in a local area, but not include changes that would affect the viability of local or regional populations or communities. Changes to local ecological processes would be minimal.	Adverse impact – Management actions would result in a clearly detectable change in terrestrial resources that could have an appreciable adverse effect on the community. This could include changes to a local population sufficient to cause a change in the abundance, distribution, fragmenting features, or composition of local terrestrial resources, but not changes that would affect the viability of regional populations or communities. Changes to local ecological processes would be of limited extent.	Adverse impact – Management actions would result in a clearly detectable change in terrestrial resources that could have severely adverse effect on the community. The impacts would be substantial and highly noticeable and could result in widespread change. This could include changes in the abundance, fragmenting features, distribution, or composition of local terrestrial resources or regional terrestrial resources to the extent that it would not be likely to recover. Considerable ecological processes would be altered, and changes would be expected.
		Beneficial impact – Management actions would restore or preserve terrestrial resources in some areas on and near the trail.	Beneficial impact – Management actions would restore or preserve terrestrial resources in many areas on and near the trail.	Beneficial impact – Management actions would restore or preserve terrestrial resources throughout much of the areas on and near the trail.

■ Impacts on Terrestrial Resources – Alternative 1 (Continuation of Current Management)

Terrestrial Wildlife. In Alternative 1, trail partners would continue to manage sites in ways that promote conservation stewardship of Chesapeake Bay-related terrestrial resources in accordance with signed MOU agreements between each partner and NPS. Efforts by partners to manage terrestrial resources would likely have negligible to minor long-term beneficial impacts on terrestrial wildlife and habitats based on

sound management practices (e.g., preventing habitat destruction, preventing trampling, restriction of visitation in sensitive habitats, removal of invasive species, etc.).

Terrestrial Vegetation. In Alternative 1, trail partners would continue to manage their sites in ways that promote conservation stewardship of Chesapeake Bay-related terrestrial vegetation in accordance with agreements in the MOU between the partner and the NPS. Efforts at partner sites would likely have negligible to minor long-term beneficial impacts on vegetation based on sound management practices (e.g., preventing habitat destruction, preventing trampling, restriction of visitation in sensitive habitats, removal of invasive species, etc.).

With Alternative 1, no new protection, new acquisitions, and/or management of new resource sites are planned. As a result, vegetation at some landing sites not owned by partners would remain susceptible to human and/or natural impacts. Native vegetation could be overrun and out-competed by invasive exotic vegetation. Native vegetation could be destroyed by trampling and overuse. Native vegetation would remain under the constant threat of destruction by development.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term beneficial impacts because of enhanced management of at some sites along the trail by partners that have signed MOUs, and the promotion of conservation stewardship of Chesapeake Bay resources by these partners.

Cumulative Impacts on Terrestrial Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to terrestrial resources in and around the study area. Reasonably foreseeable future actions generally include development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on terrestrial resources would be subject to local regulations requiring storm water management, air quality control, and planting of native plant species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on terrestrial resources, although impacts would continue to occur at a reduced level. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on terrestrial resources. Alternative 1 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Terrestrial Resources – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Terrestrial Wildlife. The likely benefits to terrestrial wildlife from conservation management at partner-owned properties described for Alternative 1 also apply to Alternative 2.

Construction (e.g., parking area clearing, boat launch construction, etc.) proposed in Alternative 2 at new access sites would likely result in some direct impacts to wildlife at previously undeveloped areas. Some impacts to wildlife habitat are likely following any development activities at new access sites (e.g. squirrel and bird habitat impacts from tree and shrub removal).

Alternative 2 would be expected to have negligible to minor adverse, short-term and long-term impacts on terrestrial wildlife from expected minor construction impacts at proposed new access sites, limited control of lands adjacent to the trail, and limited ability to acquire new resource.

Terrestrial Vegetation. The likely benefits to terrestrial vegetation from conservation management at partner-owned properties described for Alternative 1 also apply to Alternative 2.

Construction (e.g., parking area clearing, boat launch construction, etc.) needed at new access sites proposed in Alternative 2 would likely result in some direct impacts to terrestrial vegetation at undeveloped sites. Alternative 2 would be expected to have negligible to minor adverse, short-term impacts on terrestrial vegetation from possible minor construction impacts at new access sites, limited control of lands adjacent to the trail, and limited ability to acquire new resource.

Overall, implementation of Alternative 2 would likely have negligible to minor short-term adverse impacts on terrestrial resources from possible limited construction at new access sites, limited control of lands adjacent to the trail, and limited ability to acquire new resources. Acquiring new sites, or working with partners to develop new access sites, could result in negligible to minor short-term adverse impacts related to construction activities.

Cumulative Impacts on Terrestrial Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to terrestrial resources in and around the study area. Reasonably foreseeable future actions generally include development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on terrestrial resources would be subject to local regulations requiring storm water management, air quality control, and planting of native plant species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on terrestrial resources, although impacts would continue to occur at a reduced level. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on terrestrial resources. Alternative 2 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Terrestrial Resources – Alternative 3 (Chesapeake Region in the 17th Century)**

Terrestrial Wildlife. All the potential benefits to terrestrial wildlife at partner sites described for Alternative 2 also apply to Alternative 3. In addition, the expected negligible to minor, short-term construction impacts to terrestrial vegetation at new access sites described for Alternative 2 would also apply to Alternative 3.

A benefit of Alternative 3 is the provision of funding to acquire new resource sites, including historic landing sites, American Indian archeological sites, and evocative landscape sites. Conservation management practices implemented once these properties are acquired by partners and/or the NPS would protect terrestrial wildlife and eliminate the threat of loss of wildlife habitat from future development. Therefore, Alternative 3 is likely to have moderate beneficial long-term impacts on terrestrial wildlife because of the expanded funding for acquiring new resource sites along the trail.

Terrestrial Vegetation. All the potential benefits to terrestrial vegetation at partner sites described for Alternative 1 also apply to Alternative 3. In addition, the expected negligible to minor, short-term construction impacts to terrestrial vegetation at new access sites described for Alternative 2 also would apply to Alternative 3.

The proposed funding for new significant resource sites (e.g., American Indian archeology sites or evocative landscape sites) would provide the moderate long-term beneficial impacts to native vegetation by putting these sites under perpetual conservation management practices. As a result, terrestrial vegetation on these sites would not be lost due to future development.

Overall, implementation of Alternative 3 would likely have moderate long-term beneficial impacts on terrestrial resources from the expanded possibility to acquire and new resource sites, and enhanced management and protection at new and existing sites. Acquiring new sites, or working with partners to develop new access sites, could result in negligible to minor short-term adverse impacts related to construction activities.

Cumulative Impacts on Terrestrial Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to terrestrial resources in and around the study area. Reasonably foreseeable future actions generally include development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on terrestrial resources would be subject to local regulations requiring storm water management, air quality control, and planting of native plant species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on terrestrial resources, although impacts would

continue to occur at a reduced level. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on terrestrial resources. Alternative 3 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Terrestrial Resources – Alternative 4 (Recreation on the Historic Trail)**

Terrestrial Wildlife. All potential benefits to terrestrial wildlife at partner sites described for Alternative 1 also apply to Alternative 4. The possible negligible to minor adverse, short-term construction impacts to terrestrial wildlife habitat at new access sites described for Alternative 2 would also occur with Alternative 4.

Monitoring of wildlife and wildlife habitat proposed in Alternative 4 would provide information that could restrict visitor access to sensitive wildlife and/or vegetation areas at trail related sites. The proposed habitat restoration by volunteer organizations in Alternative 4 would further benefit terrestrial wildlife by potentially restoring terrestrial vegetation. For example, degraded vegetation along shorelines could be replanted and restored, thereby providing a vegetated buffer and new habitat for birds and other wildlife along rivers, streams and the Chesapeake Bay. These provisions in Alternative 4 could have minor long-term beneficial impacts on terrestrial wildlife.

Terrestrial Vegetation. All potential benefits to terrestrial vegetation at partner sites described for Alternative 1 also apply to Alternative 4. The possible negligible to minor adverse, short-term construction impacts to terrestrial vegetation at new access sites described for Alternative 2 would also occur with Alternative 4.

The proposed habitat restoration by volunteer organizations in Alternative 4 would further benefit terrestrial vegetation by potentially restoring plant communities and restricting the impact of invasive species. These provisions in Alternative 4 could have minor long-term beneficial impacts on terrestrial vegetation.

Overall, implementation of Alternative 4 would likely have minor long-term beneficial impacts on terrestrial resources because of potential NPS technical assistance in management, planning, and monitoring at partner sites, provisions for grant assistance, and the volunteer cleanup, monitoring, and habitat restorations. Acquiring new sites, or working with partners to develop new access sites, could result in negligible to minor short-term adverse impacts related to construction activities.

Cumulative Impacts on Terrestrial Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to terrestrial resources in and around the study area. Reasonably foreseeable future actions generally include development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has

adversely impacted terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on terrestrial resources would be subject to local regulations requiring storm water management, air quality control, and planting of native plant species. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on terrestrial resources, although impacts would continue to occur at a reduced level. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on terrestrial resources. Alternative 4 would contribute an imperceptible impact to the total cumulative impacts.

■ **Conclusion – Impacts on Terrestrial Resources**

Alternative 1 would likely result in negligible to minor long-term beneficial impacts on terrestrial resources, because of enhanced management of at some sites along the trail by partners that have signed MOUs, and the promotion of conservation stewardship of Chesapeake Bay resources by these partners.

Alternative 2 would likely result in negligible to minor long-term beneficial impacts on terrestrial resources due to efforts to encourage partners and properties managers to follow best management practices, conservation and stewardship education. Negligible to minor short-term adverse impacts on terrestrial resources could result from limited construction at new access sites.

Alternative 3 would likely result in moderate long-term beneficial impacts on terrestrial resources from the expanded possibility to acquire and new resource sites, and enhanced management and protection at new and existing sites. Acquiring new sites, or working with partners to develop new access sites, could result in negligible to minor short-term adverse impacts related to construction activities.

Alternative 4 would likely result in minor long-term beneficial impacts on terrestrial resources because of the proposed NPS technical assistance in management, planning, and monitoring at partner sites, provisions for grant assistance, and the volunteer cleanup, monitoring, and habitat restorations. Negligible to minor short-term adverse impacts on terrestrial resources could result from limited construction at new access sites.

5.3.3 Threatened, Endangered, and Rare Species

■ **Methodology**

In this EA, impacts on threatened, endangered and rare species are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect. The list of federally protected species with known populations near the Captain John Smith Chesapeake NHT and adjacent shorelines were obtained from U.S. Fish and Wildlife Service offices serving Delaware, Maryland, Virginia, and the District of Columbia.

The impacts assessment for threatened, endangered, and rare species was conducted in accordance with NPS 77: Natural Resource Management Guidelines, NPS Management Policies; Director’s Order 2: Planning; and NPS Director’s Order 12: Environmental Impact Analysis (2001). These documents provide general guidance for compliance with environmental laws, executive orders, and other regulations, including the National Environmental Policy Act of 1969 (NEPA), the Endangered Species Act, the Clean Air Act, the Clean Water Act, Executive Order 11988 (Floodplain Management), and Executive Order 11990 (Protection of Wetlands).

Table 5.3 presents the impact intensity definitions used for purposes of analyzing potential impacts on threatened, endangered, and rare species.

Table 5.3 Impact Intensity Definitions – Threatened, Endangered, and Rare Species

Impact Topic	Negligible	Minor	Moderate	Major
Threatened, Endangered, and Rare Species	Management actions would result in impacts on threatened, endangered, and rare species that would not be detectable or would be at the lowest level of detection. Ecological processes and biological productivity would not be affected.	Adverse impact – Management actions would result in a detectable change in threatened, endangered, and rare species, but the change would be slight and have only a local effect on the species. Changes to local ecological processes would be minimal.	Adverse impact – Management actions would result in a clearly detectable change in threatened, endangered, and rare species that could have an appreciable adverse effect on the community. Changes to local ecological processes would be of limited extent.	Adverse impact – Management actions would result in a clearly detectable change in threatened, endangered, and rare species that could have severely adverse effect on the community. The impacts would be substantial and highly noticeable and could result in widespread change. Considerable ecological processes would be altered, and changes would be expected.
		Beneficial impact – Management actions would restore or preserve threatened, endangered, and rare species in some areas on and near the trail.	Beneficial impact – Management actions would restore or preserve threatened, endangered, and rare species in many areas on and near the trail.	Beneficial impact – Management actions would restore or preserve threatened, endangered, and rare species throughout much of the areas on and near the trail.

■ **Impacts on Threatened, Endangered, and Rare Species – Alternative 1 (Continuation of Current Management)**

For Alternative 1, all partner-owned resource and/or trail access sites would continue current practices designed to protect all federal and state listed species occurring on their properties in compliance with the trail MOU.

Management practices at partner sites would reduce sediment, pollutants, and trash from entering Chesapeake Bay, which could indirectly result in negligible long-term beneficial impacts on protected species (e.g. sturgeon, Maryland darter, sea turtles) by reducing negative impacts to water quality.

Threatened, endangered, and rare species populations occurring at resource sites not currently owned or managed by NPS or trail partners would remain potentially unprotected and vulnerable to future development impacts. Visitations on these sites could impact protected species through trampling, noise disturbances, or improper management activities (e.g., mowing, pesticide use, etc). Any of these impacts could have minor long-term adverse impacts on habitats and make them inhabitable for threatened, endangered, and rare species.

No trail funding for new acquisitions would be made available under Alternative 1. As a result, if protected species occur on potential resource properties, some populations could be experience adverse, short or long-term impacts.

Overall, implementation of Alternative 1 would likely have negligible long-term beneficial impacts on federally protected species at partner sites because of trail partnership MOU agreed to by the partners to promote conservation stewardship of natural (including protected species) and cultural resources. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Cumulative Impacts on Threatened, Endangered, and Rare Species. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to threatened, endangered, and rare species in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic and terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on threatened, endangered, and rare species would be subject to local regulations requiring storm water management, air quality control, planting of native plant species, and the construction of green infrastructure. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on threatened, endangered, and rare species, although impacts would continue to occur at a reduced level. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on threatened, endangered, and rare species. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Threatened, Endangered, and Rare Species –Alternative 2 (Exploratory Voyages of Captain John Smith)**

For Alternative 2, the benefits to threatened, endangered, and rare species existing on partner sites and/or aquatic populations of protected species described in Alternative 1 also apply. The trail partnership MOU stipulates that the partners agree to protect natural resources, including protected species. All potential

adverse impacts to protected species at non-partner sites described for Alternative 1 also apply to Alternative 2.

Alternative 2 differs from Alternative 1 in that it proposes new NPS funding to acquire access sites where needed along the trail. If federal and/or state protected species populations occur on these new access sites, then conservation management actions could be implemented to protect these populations.

Overall, Alternative 2 would likely have negligible long-term beneficial impacts to threatened, endangered, and rare species because of existing partnership agreements on conservation management and proposed NPS funding for new access sites which could potentially provide protection to these species populations following purchase and implementation of conservation management plans. Any protected populations occurring on many of the sites along the trail that are not managed by NPS or NPS partners could continue to be exposed to potential adverse impacts. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Cumulative Impacts on Threatened, Endangered, and Rare Species. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to threatened, endangered, and rare species in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic and terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on threatened, endangered, and rare species would be subject to local regulations requiring storm water management, air quality control, planting of native plant species, and the construction of green infrastructure. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on threatened, endangered, and rare species, although impacts would continue to occur at a reduced level. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on threatened, endangered, and rare species. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Threatened, Endangered, and Rare Species – Alternative 3 (Chesapeake Region in the 17th Century)**

For Alternative 3, the benefits to threatened, endangered, and rare species existing on partner sites and/or aquatic populations of protected species described in Alternative 1 also apply. All potential impacts to protected species at non-partner sites described for Alternative 1 also apply to Alternative 3.

Alternative 3 also proposes the ability to assist in the acquisition of significant resource sites that are presently under an immediate threat of adverse impacts to trail related resources. This expanded funding

for acquiring new resource sites (e.g., American Indian archeological sites, or evocative landscape sites) would likely have additional minor long-term beneficial impacts to threatened, endangered, and rare species by potentially placing these new sites, which may also have protected species populations, present under conservation management guidelines. Even if protected species populations do not occur on the resource sites, these new acquisitions would likely benefit protected aquatic animals by reducing amounts of runoff sediment and pollutants from entering the Chesapeake Bay and tributaries.

Overall, implementation of Alternative 3 would likely have minor long-term beneficial impacts on threatened, endangered, and rare species because of the existing MOUs with partners. In addition, the potential for funding and technical assistance to partners, and potential funding for both new access sites and new resource sites to be managed by NPS and partners around the Chesapeake Bay and tributaries could have minor long-term beneficial impacts. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Cumulative Impacts on Threatened, Endangered, and Rare Species. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to threatened, endangered, and rare species in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic and terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on threatened, endangered, and rare species would be subject to local regulations requiring storm water management, air quality control, planting of native plant species, and the construction of green infrastructure. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on threatened, endangered, and rare species, although impacts would continue to occur at a reduced level. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on threatened, endangered, and rare species. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts to Threatened, Endangered, and Rare Species – Alternative 4 (Recreation on the Historic Trail)**

In Alternative 4, the potential benefits to any protected species population on partner sites and on nearby aquatic sites described in Alternative 1 also apply. All potential adverse impacts to protected species at non-partner sites described for Alternative 1 also apply to Alternative 4. The potential benefits to protected species following potential acquisition of new access sites described for Alternative 2 also apply to Alternative 4.

The proposed emphasis on volunteer restoration projects and cleanup efforts proposed in Alternative 4 would likely provide some indirect negligible long-term beneficial impacts to threatened, endangered, and rare species populations by maintaining or improving water quality in the Chesapeake Bay and tributaries and potentially providing and/or protect crucial habitat for these species

Overall, implementation of Alternative 4 would likely have negligible long-term beneficial impacts to threatened, endangered, and rare species by maintaining MOUs with trail partners, providing assistance and technical expertise, and supporting an emphasis on volunteer restoration projects and cleanup efforts. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Cumulative Impacts on Threatened, Endangered, and Rare Species. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to threatened, endangered, and rare species in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements involving that have resulted in or could result in loss of habitat. Fragmentation, non-native species introduction, drainage alterations, erosion and sedimentation, introduction of contaminants from urban runoff, and loss due to herbicide drift, has adversely impacted aquatic and terrestrial areas that abut developed land. Reasonably foreseeable actions that would have impacts on threatened, endangered, and rare species would be subject to local regulations requiring storm water management, air quality control, planting of native plant species, and the construction of green infrastructure. Compliance with these regulations would reduce the extent of impacts of foreseeable actions on threatened, endangered, and rare species, although impacts would continue to occur at a reduced level. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on threatened, endangered, and rare species. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ **Conclusion – Impacts on Threatened, Endangered, and Rare Species**

Alternative 1 would likely result in negligible long-term beneficial impacts on threatened, endangered, and rare species at partner sites because of trail partnership MOU agreed to by the partners to promote conservation stewardship of natural (including protected species) and cultural resources. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Alternative 2 would likely result in negligible long-term beneficial impacts on threatened, endangered, and rare species because of partnership agreements, including conservation management and proposed NPS funding for new access sites which could potentially provide protection to these species populations

following purchase and implementation of conservation management plans. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Alternative 3 would likely result in minor long-term beneficial impacts on threatened, endangered, and rare species because of the existing MOUs with partners, the potential for funding and technical assistance to partners. In addition, the potential for funding and technical assistance to partners, and potential funding for both new access sites and new resource sites to be managed by NPS and partners around the Chesapeake Bay and tributaries could have minor long-term beneficial impacts. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

Alternative 4 would likely result in negligible long-term beneficial impacts on threatened, endangered, and rare species by maintaining MOUs with trail partners, providing assistance and technical expertise, and supporting an emphasis on volunteer restoration projects and cleanup efforts. Long-term adverse impacts on threatened, endangered, and rare species due to an increase in trail users would likely be negligible.

5.4 Impacts on Cultural Resources

5.4.1 Archeological Resources

■ Methodology

In this EA, impacts on archeological resources are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

CAJO NHT will fully comply with *36 CFR 800*, regulations of the Advisory Council on Historic Preservation for compliance with Section 106 of the *National Historic Preservation Act* in the future when projects are detailed to the level of specificity that a determination of effect could be identified.

Table 5.4 presents the impact intensity definitions used for purposes of analyzing potential impacts on archeological resources.

■ Impacts on Archeological Resources – Alternative 1 (Continuation of Current Management)

Archeological resources at partner-affiliated sites would continue to be managed in accordance with the trail MOU. The MOU requires partners to promote and interpret conservation stewardship of trail-related cultural resources and ensure low-impact use of those resources. NPS would provide assistance to identify resources significant to the trail. Methods employed for archaeological resource monitoring, maintenance and protection would be at the discretion of the partners.

Table 5.4 Impact Intensity Definitions – Archeological Resources

Impact Topic	Negligible	Minor	Moderate	Major
Archeological Resources	Management actions would result in impacts to archeological resources at the lowest levels of detection with neither adverse nor beneficial consequences.	Adverse impact – Actions would cause site disturbances resulting in little, if any, loss of integrity.	Adverse impact – Actions would cause site disturbances resulting in loss of integrity.	Adverse impact – Actions would cause site disturbances resulting in loss of integrity.
		Beneficial impact – Actions would result in minimal disturbances. Actions would contribute to maintenance or preservation of a site or sites.	Beneficial impact – Actions would result in mitigation procedures and comprehensive site condition assessments and data recovery. Actions would result in stabilization of sites.	Beneficial impact – Actions would result in a mitigation procedure and a comprehensive site condition assessment and data recovery. Action would result in active intervention to preserve a site.

NPS would not provide integrated standards or guidance on appropriate treatments needed to protect resources. Standards of resource stewardship would vary among partners, and some standards may not be adequate to fully protect cultural resources over the long-term. Partner sites who receive NPS financial assistance for projects that may affect archaeological resources would be required to consult with their SHPO about appropriate protection measures.

Archeological resources in the trail vicinity that are on privately owned property would receive no measures of protection to minimize impact on integrity except for those listed or eligible for listing on the NRHP. Resources on public land would be protected when actions trigger a review of compliance with federal or local Section 106 or other applicable preservation laws. Archeological resources at these sites could be degraded through inadequate protection; inadequate research regarding the importance of location, and integrity of resources; through development or land use changes; and, inadvertent damage from trail users.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term adverse impacts on archeological resources at partner sites. A lack of overall protection standards combined with a lack of new funding for protection and/or maintenance at known sites would result in uneven attention to archeological resource protection.

Cumulative Impacts on Archeological Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to archeological resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in disturbance or loss of archeological resources. Local public policies or regulations provide a minimum degree of protection for archeological resources on private land during the land development process. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to archeological resources in accordance with Section 106 of the NHPA. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative

long-term moderate adverse impact on archeological resources. Alternative 1 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Archeological Resources – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Under Alternative 2, sites targeted for partnership and sites with significant trail resources are those points known to be Smith voyage landing sites. NPS acquisition of significant Smith voyage landing sites could occur if there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical to the implementation of the comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including archeological resources, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS on developing a protection and preservation agenda, and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to archeological resources. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. Methods employed for archaeological resource monitoring, maintenance and protection would be at the discretion of the partners.

NPS would not provide integrated standards or guidance on appropriate treatments needed to protect resources. Standards of resource stewardship would vary among partners, and some standards may not be adequate to fully protect cultural resources over the long-term. Protection of archeological resources at voyage landing sites would be assured on any lands acquired by, or with assistance from, NPS. Archeological resources may receive some measure of protection when properties are listed or eligible for listing on the NRHP or when actions trigger a review of compliance with existing local preservation ordinances or state or federal law.

Overall, implementation of Alternative 2 would likely have moderate long-term beneficial impacts on archeological resources at significant Smith voyage landing sites through availability of NPS technical assistance for preservation and protection and implementation of a preservation agenda. In addition, archeological resources on land acquired by NPS or with assistance from NPS would receive long-term beneficial impacts.

Cumulative Impacts on Archeological Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to archeological resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in disturbance or loss of archeological resources. Local public policies or regulations provide a

minimum degree of protection for archeological resources on private land during the land development process. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to archeological resources in accordance with Section 106 of the NHPA. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on archeological resources. Alternative 2 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Archeological Resources – Alternative 3 (Chesapeake Region in the 17th Century)**

Under Alternative 3, sites targeted for partnership and those with significant trail resources are sites that evoke landscapes and viewsheds of the 17th century Chesapeake region, are important to the region's American Indian communities, those with the potential to provide important archeological information, and those points known to be Smith voyage landing sites. Alternative 3 specifies that the NPS can acquire, or assist in the acquisition of, significant landing sites, American Indian sites, archeological sites, and/or evocative landscape sites when there is a willing seller and the site is critical to the implementation of the comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including archeological resources, to trail partners. A cooperative resource preservation and land conservation agenda would be developed and implemented in partnership with federal, state, and local government agencies, non-governmental organizations, American Indian communities, and private property owners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to archeological resources. Interpretation, outreach, and education, including public archeology programs, have the potential to beneficially impact public stewardship of archeological resources. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. The NPS would consult with the Advisory Council on matters relating to the trail.

Overall, implementation of Alternative 3 would likely have moderate long-term beneficial impacts on archeological resources. Alternative 3 provides the greatest scope to identify and protect significant trail sites and resources by including voyage landing sites, American Indian sites, archeological sites, and evocative landscapes. Resource protection agendas for existing sites and for sites with acquisition potential are most comprehensive under Alternative 3.

Cumulative Impacts on Archeological Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to archeological resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have

resulted in disturbance or loss of archeological resources. Local public policies or regulations provide a minimum degree of protection for archeological resources on private land during the land development process. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to archeological resources in accordance with Section 106 of the NHPA. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on archeological resources. Alternative 3 would contribute an imperceptible impact to the total cumulative impacts.

■ **Impacts on Archeological Resources – Alternative 4 (Recreation on the Historic Trail)**

Under Alternative 4, significant resource sites are Smith voyage landing sites that provide public access or have the potential to provide public access to the trail. NPS acquisition or assisted acquisition could occur where there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical for the implementation of the trail comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including archeological resources, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS on developing a protection and preservation agenda, and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to archeological resources. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. Methods employed for archaeological resource monitoring, maintenance and protection would be at the discretion of the partners. New trail partnerships would be developed and would emphasize expansions of recreational opportunities and public access.

Archeological resources may receive some measure of protection when properties are listed or eligible for listing on the NRHP or when actions trigger a review of compliance with existing local preservation ordinances or state or federal law.

Overall, implementation of Alternative 4 would likely have negligible to minor long-term beneficial impacts on archeological resources at significant trail sites. While technical assistance for resource protection would be provided at partner sites, this alternative's emphasis on recreational opportunities may pose challenges to adequately protect archeological resources in the absence of financial assistance to balance protection against increased visitor use.

Cumulative Impacts on Archeological Resources . Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to archeological resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property,

transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in disturbance or loss of archeological resources. Local public policies or regulations provide a minimum degree of protection for archeological resources on private land during the land development process. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to archeological resources in accordance with Section 106 of the NHPA. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on archeological resources. Alternative 4 would contribute an imperceptible impact to the total cumulative impacts.

■ **Conclusion – Impacts on Archeological Resources**

Alternative 1 would likely result in negligible to minor long-term adverse impacts on archeological resources at partner sites. A lack of overall protection standards combined with a lack of new funding for protection and/or maintenance at known sites would result in uneven attention to archeological resource protection.

Alternative 2 would likely result in moderate long-term beneficial impacts on archeological resources at significant Smith voyage landing sites through availability of NPS technical assistance for preservation and protection and implementation of a preservation agenda.

Alternative 3 would likely result in moderate long-term beneficial impacts on archeological resources because this alternative provides the greatest scope to identify protect significant sites and resources and resource protection agendas for existing sites and for sites with acquisition potential are most comprehensive under Alternative 3.

Alternative 4 would likely result in negligible to minor long-term beneficial impacts on archeological resources at significant trail sites. While some resources near specific sites may be protected this alternative would leave many resources near the trail unprotected.

5.4.2 Historic Structures

■ **Methodology**

In this EA, impacts on historic structures are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

CAJO NHT will fully comply with *36 CFR 800*, regulations of the Advisory Council on Historic Preservation for compliance with Section 106 of the *National Historic Preservation Act* in the future when projects are detailed to the level of specificity that a determination of effect could be identified.

Table 5.5 presents the impact intensity definitions used for purposes of analyzing potential impacts on historic structures.

Table 5.5 Impact Intensity Definitions – Historic Structures

Impact Topic	Negligible	Minor	Moderate	Major
Historic Structures	Management actions would result in alterations of patterns or features of historic structures at the lowest levels of detection with neither adverse nor beneficial consequences.	Adverse impact – Management actions would result in alteration of features that would not diminish the overall integrity of the resource.	Adverse impact – Management actions would result in alteration of features that would diminish the overall integrity of the resource.	Adverse impact – Management actions would result in alteration of features that would diminish the overall integrity of the resource.
		Beneficial impact – Management actions would result in stabilization/preservation of character-defining feature(s) in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> . Integrity of structures would be maintained.	Beneficial impact – Management actions would result in alterations to structures; however, all mitigation measures would be accomplished in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> . Integrity of structures would be rehabilitated or enhanced.	Beneficial impact – Management actions would result in alterations to structures; however, all mitigation measures would be accomplished in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> . Integrity and character of structures would be restored.

▪ Impacts on Historic Structures – Alternative 1 (Continuation of Current Management)

Historic structures at partner affiliated sites would continue to be managed in accordance with the trail MOU, which requires partners to promote and interpret conservation stewardship of trail-related cultural resources and ensure low-impact use of those resources. NPS would provide assistance to identify resources significant to the trail. Methods employed for historic structure maintenance and protection would be at the discretion of the partners.

NPS would not provide integrated standards or guidance on appropriate treatments needed to protect historic structures. Standards of resource stewardship would vary among partners, and some standards may not be adequate to fully protect resources over the long-term. Partner sites who receive NPS financial assistance for projects that may affect historic structures would be required to consult with their SHPO about appropriate protection measures.

Historic structures on the trail route that are listed or eligible for listing on the NRHP would receive protection against actions that impact integrity. Resources on public land would be protected when actions trigger a review of compliance with federal or local Section 106 or other applicable preservation laws.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term adverse impacts on historic structures. This impact could result from a lack of overall protection standards at partner sites; a

lack of funding for acquiring new sites; and the lack of new funding for protection and/or maintenance at known sites.

Cumulative Impacts on Historic Structures. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to historic structures in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in loss of historic structures and adverse effects to historic structures. Some local ordinances are in place to mitigate potential adverse effects of private development actions to historic structures. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to historic structures in accordance with Section 106 of the NHPA. The impact of Alternative 1 in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on historic structures. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Historic Structures – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Under Alternative 2, sites targeted for partnership and sites with significant trail resources are those points known to be Smith voyage landing sites. NPS acquisition of significant Smith voyage landing sites could occur if there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical to the implementation of the comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including historic structures, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS on developing a protection and preservation agenda, and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to historic structures. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. Methods employed for historic structure maintenance and protection would be at the discretion of the partners.

NPS would not provide integrated standards or guidance on appropriate treatments needed to protect resources. Standards of resource stewardship would vary among partners and some standards may not be adequate to fully protect cultural resources over the long-term. Protection of historic structures at voyage landing sites would be assured on any lands acquired by, or with the assistance of, NPS.

Historic structures may receive some measure of protection if properties are listed or eligible for listing on NRHP or if actions trigger a review of compliance with existing local, state, or federal law.

Overall, implementation of Alternative 2 would likely have minor long-term beneficial impacts on historic structures at significant Smith voyage landing sites through availability of NPS technical assistance for protection and implementation of a preservation agenda. In addition, historic structures on land acquired by NPS or with assistance from NPS would receive long-term beneficial impacts.

Cumulative Impacts on Historic Structures. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to historic structures in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in loss of historic structures and adverse effects to historic structures. Some local ordinances are in place to mitigate potential adverse effects of private development actions to historic structures. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to historic structures in accordance with Section 106 of the NHPA. The impact of Alternative 2 in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on historic structures. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Historic Structures – Alternative 3 (Chesapeake Region in the 17th Century)**

Under Alternative 3, sites targeted for partnership are those with significant trail resources are sites that evoke landscapes and viewsheds of the 17th century Chesapeake region, are important to the region's American Indian communities, those with the potential to provide important archeological information, and those points known to be Smith voyage landing sites. Alternative 3 specifies that NPS can acquire or assist in the acquisition of significant landing sites, American Indian sites, archeological sites, and/or evocative landscape sites when there is a willing seller and the site is critical to the implementation of the CMP.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including historic structures, to trail partners. A cooperative resource preservation and land conservation agenda would be developed and implemented in partnership with federal, state, and local government agencies, non-governmental organizations, American Indian communities and private property owners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to historic structures. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. The NPS would consult with the Advisory Council on matters relating to the trail.

Overall, implementation of Alternative 3 would likely have minor to moderate long-term beneficial impacts on historic structures compared with other alternatives. Alternative 3 provides the greatest scope for identifying and protecting significant trail sites and resources; including voyage landing sites, American

Indian sites, archeological sites, and evocative landscapes. Resource protection agendas for existing sites and for sites with acquisition potential are the most comprehensive under Alternative 3.

Cumulative Impacts on Historic Structures. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to historic structures in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in loss of historic structures and adverse effects to historic structures. Some local ordinances are in place to mitigate potential adverse effects of private development actions to historic structures. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to historic structures in accordance with Section 106 of the NHPA. The impact of Alternative 3 in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on historic structures. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Historic Structures – Alternative 4 (Recreation on the Historic Trail)**

Under Alternative 4, significant resource sites are Smith voyage landing sites that provide public access or have the potential to provide public access to the trail. NPS acquisition or assisted acquisition could occur where there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical for the implementation of the trail comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including historic structures, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS to develop a protection and preservation agenda and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to historic structures. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. Methods employed for historic structure maintenance and protection would be at the discretion of the partners. New trail partnerships would be developed and would emphasize expansion of recreational opportunities and public access.

Standards of historic structure stewardship would vary among partners and some standards may not be adequate to fully protect resources over the long-term. Historic structures may receive some measure of protection when properties are listed or eligible for listing on the NRHP or when actions trigger a review of compliance with existing local, state, or federal laws. Stringent protection measures would be assured on any lands acquired by NPS.

Overall, implementation of Alternative 4 would likely have negligible to minor long-term adverse impacts on historic structures at significant trail sites. While technical assistance for resource protection would be provided at partner sites, the proposed emphasis in Alternative 4 on recreational opportunities and lack of financial assistance for protection measures may adversely impact resources.

Cumulative Impacts on Historic Structures. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to historic structures in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in loss of historic structures and adverse effects to historic structures. Some local ordinances are in place to mitigate potential adverse effects of private development actions to historic structures. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to historic structures in accordance with Section 106 of the NHPA. The impact of Alternative 4 in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on historic structures. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ **Conclusion – Impacts on Historic Structures**

Alternative 1 would likely result in negligible to minor long-term adverse impacts on historic structures. This impact could result from a lack of overall protection standards at partner sites; a lack of funding for acquiring new sites; and the lack of new funding for protection and/or maintenance at known sites.

Alternative 2 would likely result in minor long-term beneficial impacts on historic structures at significant Smith voyage landing sites through availability of NPS technical assistance for protection and implementation of a preservation agenda. In addition, historic structures on land acquired by NPS or with assistance from NPS would receive long-term beneficial impacts

Alternative 3 would likely result in minor to moderate long-term beneficial impacts on historic because this alternative provides a large scope for identifying and protecting significant sites and resources. Resource protection agendas for existing sites and for sites with acquisition potential are the most comprehensive under Alternative 3.

Alternative 4 would likely result in negligible to minor long-term adverse impacts on historic structures at significant trail sites because of a lack of financial assistance for protection measures may adversely impact resources.

5.4.3 Ethnographic Resources

■ Methodology

In this EA, impacts on ethnographic resources are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

CAJO NHT will fully comply with *36 CFR 800*, regulations of the Advisory Council on Historic Preservation for compliance with Section 106 of the *National Historic Preservation Act* in the future when projects are detailed to the level of specificity that a determination of effect could be identified.

Table 5.6 presents the impact intensity definitions used for purposes of analyzing potential impacts on historic structures.

Table 5.6 Impact Intensity Definitions – Ethnographic Resources

Impact Topic	Negligible	Minor	Moderate	Major
Ethnographic Resources	Management actions would result in impacts that would be barely perceptible and would neither alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs.	Adverse impact – Management actions would result in slight but noticeable impacts that would not appreciably alter resource conditions, such as traditional access or site preservation, or the relationship between the resource and the affiliated group's body of practices and beliefs.	Adverse impact – Management actions would result in apparent impacts and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's practices and beliefs, even though the group's practices and beliefs would survive.	Adverse impact – Management actions would result in apparent impacts and would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the affiliated group's body of practices and beliefs, to the extent that the survival of a group's practices and/or beliefs would be jeopardized.
		Beneficial impact – Management actions would allow access to and/or accommodate a group's traditional practices or beliefs.	Beneficial impact – Management actions would facilitate traditional access and/or accommodate a group's practices or beliefs.	Beneficial impact – Management actions would encourage traditional access and/or accommodate a group's practices or beliefs.

■ Impacts on Ethnographic Resources – Alternative 1 (Continuation of Current Management)

Current management of the trail aligns partners with the Chesapeake Bay Gateways and Watertrails Network through which technical and financial assistance is available. Partners agree to promote and interpret conservation stewardship of trail-related cultural resources and ensure low-impact use of those resources. The extent to which a partner is able to minimize negative impacts or advance beneficial impacts on ethnographic resources varies with the type of resource and type of partner.

NPS would provide assistance to identify ethnographic resources significant to the trail. At some partner sites, more discrete ethnographic resources such as objects or sites and some landscape features would more readily be protected from negative impact. Some ethnographic landscapes may suffer an adverse impact due to a geographic scope that spills over site boundaries or a landscape for which the interpretation or affiliated heritage is contested.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term adverse impacts on ethnographic resources. These impacts could be a result of a lack of overall protection standards at partner sites; a lack of funding for acquiring new sites; and, the lack of new funding for identification, protection and/or maintenance at known sites.

Cumulative Impacts on Ethnographic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to ethnographic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in a loss of ethnographic resources and adverse effects to ethnographic resources. Local public policies or regulations are generally not in place to protect ethnographic resources on private land during the land development process. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on ethnographic resources. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Ethnographic Resources – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Under Alternative 2, sites targeted for partnership and sites with significant trail resources are those points known to be Smith voyage landing sites. NPS acquisition of significant Smith voyage landing sites could occur if there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical to the implementation of the comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including ethnographic resources, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS on developing a protection and preservation agenda, and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds for projects that affect resources. Those grant projects would be subject to review by appropriate SHPO for protection against negative impact to some ethnographic resources such as historic structures. However, less discrete resources such as ethnographic landscapes may suffer from overlapping or competing interpretation or stewardship.

Standards of resource stewardship would vary among partners, and some standards may not be adequate to fully protect cultural resources over the long-term. Protection of ethnographic resources at voyage landing sites would be assured on any lands acquired by, or with acquisition assistance from, NPS.

Overall, implementation of Alternative 2 would likely have negligible to minor long-term beneficial impacts on ethnographic resources at significant Smith voyage landing sites. Availability of NPS technical assistance for preservation and implementation of a preservation agenda contributes positively. However, a lack of funding for ethnographic resource identification would result in no benefit to some resources.

Cumulative Impacts on Ethnographic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to ethnographic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in a loss of ethnographic resources and adverse effects to ethnographic resources. Local public policies or regulations are generally not in place to protect ethnographic resources on private land during the land development process. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on ethnographic resources. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Ethnographic Resources – Alternative 3 (Chesapeake Region in the 17th Century)**

Under Alternative 3, sites targeted for partnership and those with significant trail resources are sites that evoke landscapes and viewsheds of the 17th century Chesapeake region, are important to the region's American Indian communities, those with the potential to provide important archeological information, and those points known to be Smith voyage landing sites. Alternative 3 specifies that the NPS can acquire, or assist in the acquisition of, significant landing sites, American Indian sites, archeological sites, and/or evocative landscape sites when there is a willing seller and the site is critical to the implementation of the comprehensive management plan.

The NPS would provide technical assistance for the protection and preservation of significant trail resources, including ethnographic resources, to trail partners. A cooperative resource preservation and land conservation agenda would be developed and implemented in partnership with federal, state, and local government agencies, non-governmental organizations, American Indian communities and private property owners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to discrete ethnographic resources such as objects, structures, and archeological sites. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. The NPS would consult with the Advisory Council on matters relating to the trail.

Under Alternative 3, a programmatic approach to identification and protection of significant ethnographic resources would be implemented. Consultation with American Indian communities, working watermen, African American communities and other groups would inform a resource protection agenda. Continuing ethnographic survey projects and collaborative consultations would enable NPS to identify significant ethnographic resources and better enable stewardship of those resources.

Overall, implementation of Alternative 3 would likely have minor to moderate long-term beneficial impacts on ethnographic resources. Alternative 3 provides the greatest scope for identifying significant trail sites and resources; including voyage landing sites, American Indian sites, archeological sites, and evocative landscapes. Resource protection agendas for existing sites and for sites with acquisition potential are most comprehensive under Alternative 3.

Cumulative Impacts on Ethnographic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to ethnographic resources in and around the study area.

Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in a loss of ethnographic resources and adverse effects to ethnographic resources. Local public policies or regulations are generally not in place to protect ethnographic resources on private land during the land development process. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on ethnographic resources. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Ethnographic Resources – Alternative 4 (Recreation on the Historic Trail)**

Under Alternative 4, significant resource sites are Smith voyage landing sites that provide public access or have the potential to provide public access to the trail. NPS acquisition or assisted acquisition could occur where there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical for the implementation of the trail comprehensive management plan.

The NPS would provide technical assistance for the protection and preservation of significant trail resources, including ethnographic resources, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS to develop a protection and preservation agenda and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to discrete resources such as historic structures, objects and sites. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources.

New trail partnerships would be developed and would emphasize expansion of recreational opportunities and public access. With a focus on recreational opportunities, there would be a lack of attention to identification or protection of ethnographic resources such as historic landscape features, natural resources, or vestiges of cultural heritage.

Overall, implementation of Alternative 4 would likely have negligible to minor long-term adverse impacts on ethnographic resources at significant trail sites. While technical assistance for resource protection would be provided at partner sites, the proposed emphasis in Alternative 4 on recreational opportunities and lack of financial assistance for resource identification and protection may adversely impact resources.

Cumulative Impacts on Ethnographic Resources. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to ethnographic resources in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Many of these actions have resulted in a loss of ethnographic resources and adverse effects to ethnographic resources. Local public policies or regulations are generally not in place to protect ethnographic resources on private land during the land development process. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on ethnographic resources. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ Conclusion

Alternative 1 would likely result in negligible to minor long-term adverse impacts on ethnographic resources as a result of a lack of overall protection standards at partner sites; a lack of funding for acquiring new sites; and, the lack of new funding for identification, protection and/or maintenance at known sites.

Alternative 2 would likely result in negligible to minor long-term beneficial impacts on ethnographic resources at significant Smith voyage landing sites because of the proposed availability of NPS technical assistance for identification and preservation, and the potential implementation of a preservation agenda.

Alternative 3 would likely result in minor to moderate long-term beneficial impacts on ethnographic resources in the trail vicinity because this alternative proposes the greatest scope for identifying significant trail sites and resources, resource protection agendas for existing sites, and potential for sites.

Alternative 4 would likely result in negligible to minor long-term adverse impacts on ethnographic resources at significant trail sites as a result of a lack of financial assistance for resource identification and protection of ethnographic resources in the trail vicinity.

5.4.4 Cultural Landscapes

■ Methodology

In this EA, impacts on cultural landscapes are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

CAJO NHT will fully comply with *36 CFR 800*, regulations of the Advisory Council on Historic Preservation for compliance with Section 106 of the *National Historic Preservation Act* in the future when projects are detailed to the level of specificity that a determination of effect could be identified.

Table 5.7 presents the impact intensity definitions used for purposes of analyzing potential impacts on cultural landscapes.

Table 5.7 Impact Intensity Definitions – Cultural Landscapes

Impact Topic	Negligible	Minor	Moderate	Major
Cultural Landscapes	Management actions would result in alterations of patterns or features of cultural landscapes at the lowest levels of detection, barely perceptible, not measurable, and with neither negative nor positive consequences.	Adverse impact – Management actions would result in alterations of patterns or features of the landscape that would not diminish the overall integrity of the landscape.	Adverse impact – Management actions would result in alterations of patterns or features of the landscape that would diminish the overall integrity of the landscape.	Adverse impact – Management actions would result in alterations of patterns or features of the landscape that would diminish the overall integrity of the landscape.
		Beneficial impact – Management actions would result in slight alterations of landscape patterns and features in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> .	Beneficial impact – Management actions would result in alterations to landscape patterns and features; however, a treatment plan would be put in place in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> . Integrity of the landscape would be enhanced.	Beneficial impact – Management actions would result in alterations to landscape patterns and features; however, a treatment plan would be put in place in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> . Integrity of the landscape would be restored.

■ Impacts on Cultural Landscapes – Alternative 1 (Continuation of Current Management)

Current management of the trail aligns partners with the Chesapeake Bay Gateways and Watertrails Network through which technical and financial assistance is available. Partners agree to promote and interpret conservation stewardship of trail-related cultural resources and ensure low-impact use of those resources. The extent to which a partner is able to minimize negative impacts or advance beneficial impacts on cultural landscapes varies with the type of resource and mission of the partner.

NPS would provide assistance to identify cultural landscape features significant to the trail. At some partner sites, mainstream or traditional features of cultural landscapes, such as designed garden landscapes, would more readily be accepted as worthy of protection from negative impact. Other cultural landscapes, vernacular or less attractive, may not be valued by that partner and therefore may suffer from neglect or have its integrity compromised. Some cultural landscapes may suffer an adverse impact due to a geographic scope that spills over site boundaries or a landscape for which the interpretation or affiliated heritage is contested.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term adverse impacts on cultural landscapes. These impacts could be a result of a lack of overall protection standards at partner sites; a lack of funding for acquiring new sites; and, the lack of new funding for identification, protection and/or maintenance at known sites.

Cumulative Impacts on Cultural Landscapes. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to cultural landscapes in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Private development has resulted in loss of historic structures and landscape features that contribute to the cultural landscapes in the trail vicinity. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to cultural landscapes in accordance with Section 106 of the NHPA. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on cultural landscapes. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Cultural Landscapes – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Under Alternative 2, sites targeted for partnership and sites with significant trail resources are those points known to be Smith voyage landing sites. NPS acquisition of significant Smith voyage landing sites could occur if there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical to the implementation of the comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including cultural landscapes, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS on developing a protection and preservation agenda, and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds for projects that affect resources.

Standards of resource stewardship would vary among partners, and some standards may not be adequate to fully protect cultural resources over the long-term. Protection of cultural landscape features at voyage landing sites would be assured on any lands acquired by, or with acquisition assistance from, NPS.

Cultural landscapes may suffer from overlapping or competing interpretation or stewardship. The geographic size of the partner's site may compromise the integrity of a landscape where the site size is small and the resource is threatened where it extends beyond site boundaries. Certain types of vernacular landscapes may not be identified or valued by partners and therefore threatened. Under Alternative 2, no systematic survey project to determine significant cultural landscapes would be planned.

Overall, implementation of Alternative 2 would likely have negligible to minor long-term beneficial impacts on cultural landscapes at significant Smith voyage landing sites. Availability of NPS technical assistance for preservation and implementation of a preservation agenda contributes positively. However, a lack of funding for cultural landscape and other resource identification would result in no benefit to some resources.

Cumulative Impacts on Cultural Landscapes. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to cultural landscapes in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Private development has resulted in loss of historic structures and landscape features that contribute to the cultural landscapes in the trail vicinity. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to cultural landscapes in accordance with Section 106 of the NHPA. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on cultural landscapes. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Cultural Landscapes – Alternative 3 (Chesapeake Region in the 17th Century)**

Under Alternative 3, sites targeted for partnership and those with significant trail resources are sites that evoke landscapes and viewsheds of the 17th century Chesapeake region, are important to the region's American Indian communities, those with the potential to provide important archeological information, and those points known to be Smith voyage landing sites. Alternative 3 specifies that the NPS can acquire, or assist in the acquisition of, significant landing sites, American Indian sites, archeological sites, and/or evocative landscape sites when there is a willing seller and the site is critical to the implementation of the comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including cultural landscapes, to trail partners. A cooperative resource preservation and land conservation

agenda would be developed and implemented in partnership with federal, state, and local government agencies, non-governmental organizations, American Indian communities and private property owners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to discrete cultural landscape features such as structures and archeological sites. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources. The NPS would consult with the Advisory Council on matters relating to the trail.

Under Alternative 3, a programmatic approach for identification and protection of significant cultural landscape resources would be implemented. Consultation with American Indian communities, working watermen, African American communities and other groups would inform a resource protection agenda. Continuing ethnographic survey projects and collaborative consultations would enable NPS to identify significant cultural landscape resources and better enable stewardship of those resources.

Overall, implementation of Alternative 3 would likely have minor to moderate long-term beneficial impacts on cultural landscapes. Alternative 3 provides the greatest scope for identifying significant trail sites and resources; including voyage landing sites, American Indian sites, archeological sites, and evocative landscapes. Resource protection agendas for existing sites and for sites with acquisition potential are most comprehensive under Alternative 3.

Cumulative Impacts on Cultural Landscapes. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to cultural landscapes in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Private development has resulted in loss of historic structures and landscape features that contribute to the cultural landscapes in the trail vicinity. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to cultural landscapes in accordance with Section 106 of the NHPA. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on cultural landscapes. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Cultural Landscapes – Alternative 4 (Recreation on the Historic Trail)**

Under Alternative 4, significant resource sites are Smith voyage landing sites that provide public access or have the potential to provide public access to the trail. NPS acquisition or assisted acquisition could occur where there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical for the implementation of the trail comprehensive management plan.

NPS would provide technical assistance for the protection and preservation of significant trail resources, including cultural landscape features, to federal, state and local agencies, non-governmental organizations and private property owners. A friends group would work with NPS to develop a protection and preservation agenda and facilitate implementation of the agenda with partners. Trail partners could potentially receive matching grant funds and subsequent grant projects would be subject to review by appropriate SHPO for protection against negative impact to discrete resources such as historic structures and sites. Partners would be required to promote and interpret conservation stewardship of trail-related resources and ensure low-impact use of those resources.

New trail partnerships would be developed and would emphasize expansion of recreational opportunities and public access. With a focus on recreational opportunities, there would be a lack of attention to identification or protection of cultural landscape resources such as historic landscape features, natural resources, or vestiges of cultural heritage.

Overall, implementation of Alternative 4 would likely have negligible to minor long-term adverse impacts on cultural landscapes at significant trail sites. While technical assistance for resource protection would be provided at partner sites, the proposed emphasis in Alternative 4 on recreational opportunities and lack of financial assistance for resource identification and protection may adversely impact these resources.

Cumulative Impacts on Cultural Landscapes. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to cultural landscapes in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. Private development has resulted in loss of historic structures and landscape features that contribute to the cultural landscapes in the trail vicinity. Public infrastructure and transportation system projects using federal funding are required to mitigate potential adverse effects to cultural landscapes in accordance with Section 106 of the NHPA. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term moderate adverse impact on cultural landscapes. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ Conclusion

Alternative 1 would likely result in negligible to minor long-term adverse impacts on cultural landscapes as a result of a lack of overall protection standards at partner sites; a lack of funding for acquiring new sites; and, the lack of new funding for identification, protection and/or maintenance at known sites.

Alternative 2 would likely result in negligible to minor long-term beneficial impacts on cultural landscapes at significant Smith voyage landing sites because of the proposed availability of NPS technical assistance for identification and preservation, and the potential implementation of a preservation agenda.

Alternative 3 would likely result in minor to moderate long-term beneficial impacts on cultural landscapes in the trail vicinity because this alternative proposes the greatest scope for identifying significant trail sites and resources, resource protection agendas for existing sites, and potential for sites.

Alternative 4 would likely result in negligible to minor long-term adverse impacts on cultural landscapes at significant trail sites as a result of a lack of financial assistance for resource identification and protection of cultural landscapes in the trail vicinity.

5.5 Impacts on Trail Access

■ Methodology

Management actions are generally assessed in terms of how they enhance or detract from the potential for visitors to access the trail. Cultural resource management actions are described in terms of the opportunities they provide for visitors to appreciate the Captain John Smith Chesapeake NHT. Visitor experience, use, and access management actions are evaluated with respect to how they would help orient visitors to the trail and enable them to experience the trail. Also evaluated is how well improvements to visitor facilities would address existing visitor experience, use, and access management issues. Park operations actions, land protection actions, and cooperative efforts with partners are qualitatively considered in terms of how they would generally enhance visitor experience, use, and access.

Table 5.8 presents the impact intensity definitions used for purposes of analyzing potential impacts on trail access.

Table 5.8 Impact Intensity Definitions – Trail Access

Impact Topic	Negligible	Minor	Moderate	Major
Trail Access	Management actions would result in impacts that would be barely detectable, or would occasionally affect the trail access of few visitors in the applicable setting.	Adverse impact –Management actions would result in impacts that would be slight but detectable; could be perceived as negative by visitors or would inhibit trail access. Impacts would negatively affect the trail access of some visitors in the applicable setting.	Adverse impact –Management actions would result in impacts that would be readily apparent and perceived as somewhat negative. Impacts would negatively affect the trail access of many visitors in the applicable setting.	Adverse impact –Management actions would result in impacts that would be highly negative, affecting the trail access of a majority of visitors in the applicable setting.
		Beneficial impact – Management actions would positively affect the trail access of some visitors in the applicable setting.	Beneficial impact – Management actions would positively affect the trail access of many visitors in the applicable setting.	Beneficial impact – Management actions would positively affect the trail access of a majority of visitors in the applicable setting.

■ **Impacts on Trail Access – Alternative 1 (Continuation of Current Management)**

Current management of the trail aligns partners with the Chesapeake Bay Gateways and Watertrails Network through which technical and financial assistance is available. In FY2010, CBGN financial assistance applicants were invited to seek awards for planning or implementation of new access opportunities for the trail. In FY2011, awards will again focus on new public access development at CBGN sites, some of which will provide access to the trail.

Access sites are provided for land segments and for water trail segments and access development would continue in coordination with CBGN. In addition, the recently released Strategy for Protecting and Restoring the Chesapeake Bay Watershed, developed through President Obama's May 2009 Executive Order on the Chesapeake specifies that the NPS will participate in the development of a public access plan. The Strategy's goal is to increase public access to the Chesapeake Bay and tributaries by adding 300 new public access sites.

Some of the new public access sites will be developed on federal land units in the Chesapeake watershed, including those situated along the trail routes. Most of the shoreline, however, is privately owned. No monies for federal land acquisition are planned under current management.

CBGN has not received permanent authorization from Congress.

Overall, implementation of Alternative 1 would likely have negligible to minor long-term beneficial impacts on trail access because of the reliance on CBGN as the lone financial assistance provider and through a lack of sustained attention to increasing trail access needs.

Cumulative Impacts on Trail Access. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and along the trail would detract from the trail access of the park by altering the public accessibility of existing sites, altering the natural setting, and scenic resources. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on trail access. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Trail Access – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Under Alternative 2, sites targeted for partnership and sites with significant trail resources are those points known to be Smith voyage landing sites. In addition to existing sites, new trail access would be sought at significant voyage landing sites. These types of trail access could include water and land components, such as tour boats, private watercraft, bus tours, and auto tour routes.

Up to 50 additional trail access sites could be developed through partnerships with state parks, National Wildlife Refuges, tourism bureaus, heritage areas, historical societies, private sector outfitters, and tourism service providers. A new program modeled on CBGN would provide a small amount of matching grant funds for access development. While CBGN enjoys congressional authorization, its financial assistance awards may also be used to develop new trail access.

In addition, the Strategy for Protecting and Restoring the Chesapeake Bay Watershed, implementing Executive Order 13508, specifies that the NPS will participate in a public access plan to add 300 new public access sites. Some of these access sites could include Smith voyage landing sites.

Overall, implementation of Alternative 2 would likely have minor to moderate long-term beneficial impacts on trail access resulting from potential additional partnerships, adding up to 50 additional access sites, and NPS commitment to fulfilling the public access goal stated in the federal strategy for Chesapeake Bay protection and restoration released in May, 2010.

Cumulative Impacts on Trail Access. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and along the trail would detract from the trail access of the park by altering the public accessibility of existing sites, altering the natural setting, and scenic resources. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on trail access. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Trail Access – Alternative 3 (Chesapeake Region in the 17th Century)**

Under Alternative 3, trail access sites, in addition to those already existing, include sites that provide good potential and those that fill identified gaps in geographic or demographic distribution. Sites targeted for partnership and those with significant trail resources are sites that evoke landscapes and viewsheds of the 17th century Chesapeake region, are important to the region's American Indian communities, those with the potential to provide important archeological information, and those points known to be Smith voyage landing sites.

Alternative 3 specifies that the NPS can acquire, or assist in the acquisition of, significant landing sites, American Indian sites, archeological sites, and/or evocative landscape sites when there is a willing seller and the site is critical to the implementation of the comprehensive management plan.

Types of trail access would include water and land components such as tour boats, private watercraft, bus tours, and auto tour routes. Additional trail access sites would be developed through partnerships with American Indian communities, federal, state and local governments, non-profit organizations, watershed

groups, private sector outfitters, and tourism service providers. A new program modeled on CBGN would provide matching grant funds for access development. While CBGN enjoys congressional authorization, its financial assistance awards may also be used to develop new trail access.

In addition, the Strategy for Protecting and Restoring the Chesapeake Bay Watershed, implementing Executive Order 13508, specifies that the NPS will participate in a public access plan to add 300 new public access sites. Some of these access sites would be on or along the trail routes.

Overall, the implementation of Alternative 3 would likely have moderate long-term beneficial impacts on trail access as a result of potential additional partnerships, potential to add up to 100 additional access sites, specific attention to providing access in underserved areas, and NPS' commitment to fulfilling its public access goal as stated in the federal strategy for Chesapeake Bay protection and restoration released in May, 2010.

Cumulative Impacts on Trail Access. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and along the trail would detract from the trail access of the park by altering the public accessibility of existing sites, altering the natural setting, and scenic resources. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on trail access. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

▪ **Impacts on Trail Access – Alternative 4 (Recreation on the Historic Trail)**

Under Alternative 4, trail access would be a critical component of protected sites along the trail. Significant resource sites are Smith voyage landing sites that provide public access or have the potential to provide public access to the trail and areas where additional access is needed.

Types of trail access would include water and land components such as tour boats, private watercraft, bus tours, auto tour routes, and day use and camping sites. In addition, new trail partnerships emphasizing recreational opportunities would be developed to provide additional access. These new partnerships would be with federal, state and local governments, recreation providers, non-governmental organizations, private sector outfitters, and tourism service providers. This alternative could potentially add up to 100 new access sites related to the trail.

While CBGN enjoys congressional authorization, a portion of its financial assistance awards would be used to develop new trail access. In addition, the Strategy for Protecting and Restoring the Chesapeake Bay Watershed, implementing Executive Order 13508, specifies that the NPS will participate in a public access plan to add 300 new public access sites. Some of these access sites would be on or along the trail routes.

NPS acquisition or assisted acquisition could occur where there is a willing seller, the site is threatened with destruction or irreparable damage, and the site is critical for the implementation of the trail comprehensive management plan.

Overall, implementation of Alternative 4 would likely have moderate long-term beneficial impacts on trail access as a result of its emphasis on recreational opportunities and the potential to add up to 100 new access sites. However, the scope of significant trail resources where access will be provided is limited to Smith voyage landing sites.

Cumulative Impacts on Trail Access. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and along the trail would detract from the trail access of the park by altering the public accessibility of existing sites, altering the natural setting, and scenic resources. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on trail access. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ Conclusion

Alternative 1 would likely result in negligible to minor long-term beneficial impacts on trail access because of the reliance on CBGN as the lone financial assistance provider and through a lack of sustained attention to increasing trail access needs.

Alternative 2 would likely result in minor to moderate long-term beneficial impacts on trail access resulting from potential additional partnerships, adding up to 50 additional access sites, and the NPS commitment to fulfilling the public access goal stated in the federal strategy for Chesapeake Bay protection and restoration.

Alternative 3 would likely result in moderate long-term beneficial impacts on trail access as a result of potential additional partnerships, specific attention to providing access in underserved areas, adding up to 100 additional access sites, and NPS' commitment to fulfilling its public access goal as stated in the federal strategy for Chesapeake Bay protection and restoration.

Alternative 4 would likely result in moderate long-term beneficial impacts on trail access as a result of its emphasis on recreational opportunities and the potential to add up to 100 additional access sites.

5.6 Impacts on Visitor Experience

■ Methodology

Management actions are generally assessed in terms of how they enhance or detract from the potential for visitors to experience the trail. Visitor experience related management actions are described in terms of the opportunities they provide for visitors to appreciate the Captain John Smith Chesapeake NHT. Visitor experience, use, and access management actions are evaluated with respect to how they would help orient visitors to the trail and enable them to experience the trail. Also evaluated is how well improvements to visitor facilities would address existing visitor experience, use, and access management issues. Park operations actions, land protection actions, and cooperative efforts with partners are qualitatively considered in terms of how they would generally enhance visitor experience, use, and access.

Table 5.9 presents the impact intensity definitions used for purposes of analyzing potential impacts on visitor experience.

Table 5.9 Impact Intensity Definitions – Visitor Experience

Impact Topic	Negligible	Minor	Moderate	Major
Visitor Experience	Management actions would result in impacts that would be barely detectable, or would occasionally affect the experience of few visitors in the applicable setting.	Adverse impact –Management actions would result in impacts that would be slight but detectable; could be perceived as negative by visitors or would inhibit visitor experience. Impacts would negatively affect the experience of some visitors in the applicable setting.	Adverse impact –Management actions would result in impacts that would be readily apparent and perceived as somewhat negative. Impacts would negatively affect the experience of many visitors in the applicable setting.	Adverse impact –Management actions would result in impacts that would be highly negative, affecting the experience of a majority of visitors in the applicable setting.
		Beneficial impact – Management actions would positively affect the experience of some visitors in the applicable setting.	Beneficial impact – Management actions would positively affect the experience of many visitors in the applicable setting.	Beneficial impact – Management actions would positively affect the experience of a majority of visitors in the applicable setting.

■ Impacts on Visitor Experience – Alternative 1 (Continuation of Current Management)

Under Alternative 1, the Chesapeake Bay Gateways and Watertrails Network (CBGN) would continue to represent the designated gateways that are also Smith trail partners and provide financial assistance for interpretive services and product. Visitors benefit from CBGN by learning more about the diverse range of themes, places, and activities existing along the trail.

Visitors would continue to experience the trail through self-guided trips and organized trips by water or on the land, or as part of a general recreational experience in the Chesapeake region. Visitors would have access to the trail through local, state and federal parks and refuges, existing water trail routes, and auto tour routes. Partner sites along the trail would be encouraged to identify themselves as part of the trail,

and may or may not have interpretive material and programming related to John Smith's voyages. Interactive buoys, interpretive kiosks, and maps and guides would help travelers understand and navigate the historical land and seascapes.

Overall, the implementation of Alternative 1 would likely have minor long-term beneficial impacts on visitor experience. CBGN technical and financial assistance would help partners improve visitor experiences; however, partner capacity would continue to vary.

Cumulative Impacts on Visitor Experience. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to visitor experience access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and new roads in the park vicinity would detract from the visitor experience and visitor enjoyment of the park by altering the natural setting, scenic resources, and the cultural landscape; by increasing the number of people in the area; by increasing traffic; by increasing ambient noise; and, by generally reducing the character of the area. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on visitor experience and visitor use. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Visitor Experience – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Under Alternative 2, comprehensive interpretive and educational programming on the trail would be available for each of the partner sites. NPS would work with federal, state, and local partners to develop interpretive programs and media. Visitors would benefit from this standardized NPS interpretive and educational programming. Information on the trail would be made available at partner sites through brochures, maps, displays, and signage.

Matching grants would be available from NPS for any needed upgrades to visitor facilities. Alternative 2 proposes to establish several visitor contact stations at strategic points along the trail. These stations would likely include displays and maps to assist visitors in orienting themselves on the trail. The contact stations may be staffed by partners and/or volunteers at certain times during the year. NPS staff would be available to provide interpretive and educational programming and to lead trips along the trail as requested.

Overall, the implementation of Alternative 2 would likely have moderate long-term beneficial impacts on visitor experience. These impacts may result from the integration of NPS developed interpretive and educational programming at partner sites, additional access sites, and the establishment of NPS visitor contact stations which would provide further visitor experience benefits of enhanced orientation and interpretive programs.

Cumulative Impacts on Visitor Experience. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to visitor experience access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and new roads in the park vicinity would detract from the visitor experience and visitor enjoyment of the park by altering the natural setting, scenic resources, and the cultural landscape; by increasing the number of people in the area; by increasing traffic; by increasing ambient noise; and, by generally reducing the character of the area. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on visitor experience and visitor use. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Visitor Experience – Alternative 3 (Chesapeake Region in the 17th Century)**

Alternative 3 would have funding available for acquiring new resource sites. Acquisition of significant sites or evocative landscape sites would enable partners and the NPS to expand their interpretive and educational programming to include the American Indian presence during the John Smith voyage as well as interpreting the landscapes present around the Chesapeake Bay at the time of the voyages. This expanded ability to interpret American Indian cultures and the landscapes John Smith likely saw during the voyages would enhance visitor experience.

Alternative 3 proposes to establish one or two regional NPS interpretive centers along the trail. With interpretive centers, NPS staff would be able to have more interpretive programs, more educational programs (e.g., for schools), and lead more field trips along the trail compared to other alternatives. NPS interpretive centers are destinations that potential trail users would want to visit to get better oriented and educated about the John Smith voyages.

Overall, the implementation of Alternative 3 would likely have moderate long-term beneficial impacts to visitor experience through a broader range of protected sites with interpretation, through NPS-funded visitor centers, and greater opportunities for public access.

Cumulative Impacts on Visitor Experience. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to visitor experience access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and new roads in the park vicinity would detract from the visitor experience and visitor enjoyment of the park by altering the natural setting, scenic resources, and the cultural landscape; by increasing the number of people in the area; by increasing traffic; by increasing ambient noise; and, by generally reducing the character of the area. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-

term minor adverse impact on visitor experience and visitor use. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Visitor Experience – Alternative 4 (Recreation on the Historic Trail)**

Alternative 4 focuses on recreational activities along the trail routes. It also emphasizes volunteer activities such as trail cleanups and/or habitat restoration projects that would give visitors hands-on experience with the trail. As a result, participants in the volunteer programs are likely to develop a better sense of ownership for the trail, and likely develop a strong conservation ethic.

New trail partnerships would be developed and would emphasize expansions of recreational opportunities and public access. NPS would provide interpretive training to environmental project leaders, outfitters, and tour operators.

Overall, the implementation of Alternative 4 would likely have moderate long-term beneficial impacts to visitor experience through an emphasis on public access and recreational opportunities.

Cumulative Impacts on Visitor Experience. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to visitor experience access in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. New development and new roads in the park vicinity would detract from the visitor experience and visitor enjoyment of the park by altering the natural setting, scenic resources, and the cultural landscape; by increasing the number of people in the area; by increasing traffic; by increasing ambient noise; and, by generally reducing the character of the area. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term minor adverse impact on visitor experience and visitor use. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ **Conclusion**

Alternative 1 would likely result in minor long-term beneficial impacts on visitor experience. CBGN technical and financial assistance would help partners improve visitor experience; however, partner capacity would continue to vary.

Alternative 2 would likely result in moderate long-term beneficial impacts on visitor experience. These impacts could result from the integration of NPS developed interpretive and educational programming at partner sites, additional access sites, and the establishment of NPS visitor contact stations.

Alternative 3 would likely result in moderate long-term beneficial impacts on visitor experience through a broader range of protected sites with interpretive potential, through NPS-funded visitor centers, and expanded opportunities for public access.

Alternative 4 would likely result in moderate long-term beneficial impacts on visitor experience through an emphasis on recreational opportunities and expanded opportunities for public access.

5.7 Impacts on the Socioeconomic Environment

■ Methodology

In this EA, impacts on the socioeconomic environment are described in terms of type, context, duration, and intensity, which would be consistent with the regulations of the Council on Environmental Quality (CEQ) that implement NEPA. This is a policy level document and therefore it does not detail all actions to the degree of specificity necessary to make a determination of effect.

Table 5.10 presents the impact intensity definitions used for purposes of analyzing potential impacts on the socioeconomic environment.

Table 5.10 Impact Intensity Definitions – Socioeconomic Environment

Impact Topic	Negligible	Minor	Moderate	Major
Socioeconomic Environment	Management actions would result in impacts that would be barely perceptible and would neither alter socioeconomic conditions, including: population, commerce, land use, recreation and tourism.	Adverse impact – Management actions would result in slight but noticeable impacts that would not appreciably alter socioeconomic conditions, including: population, commerce, land use, recreation and tourism.	Adverse impact – Management actions would result in apparent impacts and would alter socioeconomic conditions. Something would interfere with existing socioeconomic conditions, including: population, commerce, land use, recreation and tourism.	Adverse impact – Management actions would result in apparent impacts and would alter socioeconomic conditions. Something would greatly affect socioeconomic conditions, including: population, commerce, land use, recreation and tourism.
		Beneficial impact – Management actions would slightly improve socioeconomic conditions.	Beneficial impact – Management actions would noticeably improve socioeconomic conditions.	Beneficial impact – Management actions would greatly improve socioeconomic conditions.

■ Impacts on the Socioeconomic Environment – Alternative 1 (Continuation of Current Management)

No change in the socioeconomic environment would likely result from Alternative 1. Socioeconomic changes in most counties of the Chesapeake watershed are expected as result of population shift, demographic shift, and economic conditions. NPS and its current management approach to the trail do not affect employment markets, housing, education or transportation needs. Through NPS technical assistance programs, some CBGN sites would strengthen and develop their programs which could positively impact employment at the site.

Overall, the implementation of Alternative 1 would likely have negligible impacts on the socioeconomic environment because trail-related visitation and local spending would not be expected to increase much if current management practices are continued.

Cumulative Impacts on Socioeconomic Environment. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to socioeconomic environment in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on the socioeconomic environment. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on the Socioeconomic Environment – Alternative 2 (Exploratory Voyages of Captain John Smith)**

Increases in access sites proposed for Alternative 2 would likely attract more visitors to the trail, benefitting the local economy with additional expenditures by trail visitors.

Through NPS technical assistance programs, some sites would strengthen and develop their programs which could positively impact employment at the site. However, effects on employment, population, land use, and commerce would likely have no statistical impact on socioeconomic indicators.

Overall, the implementation of Alternative 2 would likely have minor long-term beneficial impacts on the socioeconomic environment because of the possible increase in local spending from trail users.

Cumulative Impacts on Socioeconomic Environment. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to socioeconomic environment in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on the socioeconomic environment. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on the Socioeconomic Environment – Alternative 3 (Chesapeake Region in the 17th Century)**

Alternative 3 proposes funding to acquire new significant resource sites along the trail and an expanded definition of significant resources. Up to 2 new visitor centers could be built requiring additional staffing and causing an overall increase in visitors. These new sites would likely benefit local economies through increased visitor expenditures. Through NPS technical assistance programs, some sites would strengthen and develop their programs which could positively impact employment at the site.

Federal land acquisition and conservation management could make noticeable impacts to improve land use patterns in counties along the trail route. Impacts on employment, population, land use, and commerce would have slight to noticeable impacts to improve the socioeconomic environment, so these impacts would be considered moderate.

Overall, the implementation of Alternative 3 would likely have moderate long-term beneficial impacts on the socioeconomic environment because of the increase in spending near resource site, potential acquisition and staffing of new resources sites, and the potential addition of two new visitor centers.

Cumulative Impacts on Socioeconomic Environment. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to socioeconomic environment in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on the socioeconomic environment. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

■ Impacts on the Socioeconomic Environment – Alternative 4 (Recreation on the Historic Trail)

Under Alternative 4, trail development would emphasize recreational opportunities for visitors. With this emphasis, slight impacts could be seen in economic development for private outfitter services and outdoor guides. Trail users could lead to larger expenditures on equipment and services catering to outdoor enthusiasts. However, because impacts on employment, population, land use, and commerce would potentially improve the socioeconomic environment, these impacts would be moderate.

Overall, the implementation of Alternative 4 would likely have moderate long-term beneficial impacts on the socioeconomic environment because of the potential additional expenditures from trail users and increases in spending near resource sites and interpretive centers, and the likelihood of land acquisition and conservation strategies.

Cumulative Impacts on Socioeconomic Environment. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to socioeconomic environment in and around the study area. Reasonably foreseeable future actions generally include growth and development on private property, transportation system improvements, and public infrastructure improvements. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on the socioeconomic environment. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ Conclusion – Impacts on the Socioeconomic Environment

Alternative 1 would likely result in negligible impacts on the socioeconomic environment because trail-related visitation and local spending would not be expected to increase under current management practices.

Alternative 2 would likely result in minor long-term beneficial impacts on the socioeconomic environment because of the possible increases in local spending from to trail users.

Alternative 3 would likely result in moderate long-term beneficial impacts on the socioeconomic environment because of the increase in spending near resource site, potential acquisition and staffing of new resources sites, and the potential addition of two new visitor centers.

Alternative 4 would likely result in moderate long-term beneficial impacts on the socioeconomic environment because of the increase in spending near resources sites and interpretive centers, and the likelihood of land acquisition.

5.8 Impacts on Trail Administration and Management

■ Methodology

Management actions are generally assessed in terms of how they enhance or detract from the potential for visitors to experience the trail. Trail administration and management actions are described in terms of the opportunities provided to manage and assist in the management of the Captain John Smith Chesapeake NHT. Visitor experience, use, and access management actions are evaluated with respect to how they would help orient visitors to the trail and enable them to experience the trail. Park operations actions, land protection actions, and cooperative efforts with partners are qualitatively considered in terms of how they would generally enhance trail administration and management.

Table 5.11 presents the impact intensity definitions used for purposes of analyzing potential impacts on park operations.

Table 5.11 Impact Intensity Definitions – Trail Administration and Management

Impact Topic	Negligible	Minor	Moderate	Major
Trail Administration and Management	Management actions would result in impacts on trail operations and trail access that would be barely detectable to trail staff and visitors.	Adverse impact – Management actions would result in adverse impacts to trail operations and access that would be small, but would be noticeable to staff, but probably not to visitors.	Adverse impact – Management actions would result in adverse impacts to trail operations and access that would be readily apparent to staff and possibly to visitors.	Adverse impact – Management actions would result in adverse impacts to trail operations and access that would be readily apparent to staff and visitors, and would result in substantial, widespread changes.
		Beneficial impact – Management actions would result in beneficial impacts to trail operations and access that would be small, but would be noticeable to staff, but probably not to visitors.	Beneficial impact – Management actions would result in beneficial impacts to trail operations and access that would be readily apparent to staff and possibly to visitors.	Beneficial impact – Management actions would result in beneficial impacts to trail operations and access that would be readily apparent to staff and visitors, and would result in substantial, widespread changes.

- **Impacts on Trail Administration and Management – Alternative 1 (Continuation of Current Management)**

Under Alternative 1, administration and management of resource sites would continue to be the responsibility of the individual partners who own these sites. NPS through the CBGN program would provide some funding to partners, but how this is spent is largely up to the partners owning the sites. Partners would be encouraged to provide visitors interpretative programs and/or literature about the trail, but this would continue to be up to the partners on the level of effort they put into this.

Overall, the implementation of Alternative 1 would likely have negligible impacts on trail administration and management. There would not be an overall coordinated and uniform approach at all resource sites along the trail. Each partner would largely be working independently of others with limited financial and technical input from the NPS.

Cumulative Impacts on Trail Administration and Management. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail administration and management in and around the study area. Reasonably foreseeable future actions generally include transportation system improvements and public infrastructure improvements. The impact of Alternative 1, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on trail administration and management. Alternative 1 would contribute an imperceptible impact to the total cumulative impact.

- **Impacts on Trail Administration and Management – Alternative 2 (Exploratory Voyages of Captain John Smith)**

With Alternative 2, partners would continue to be responsible for day to day trail management and operations activities at their resource and access sites. NPS would provide funding to partners through the CBGN program. NPS could also provide technical assistance to develop interpretive and educational programs the trail along with providing brochures, signs and displays about the trail. The emphasis of this interpretive programming would be on the John Smith voyage story.

Also in Alternative 2, NPS would work with partners to acquire new access sites where needed and possible along the trail. Management of any new access sites would be overseen by partners and/or by the NPS if no partners participated in the acquisition.

NPS would work with partners to establish visitor contact stations at partner sites in strategic locations along the trail. Depending on the partner site, the type of visitor contact station could vary from a simple indoor or outdoor John Smith voyage trail area with displays, brochures, and maps, to a staffed area in which visitors can talk with partner's staff and/or volunteers about the trail. NPS would provide technical expertise in creating displays, signage, and maps of the trail, as well as train partner staff and volunteers on working at the visitor contact stations.

Overall, the implementation of Alternative 2 would likely have moderate long-term beneficial impacts on trail administration and management. This impact could result because of the potential for more consistent and integrated management and operations at sites along the trail; more consistent signage, displays, maps, interpretive materials; and better access to the trail.

Cumulative Impacts on Trail Administration and Management. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail administration and management in and around the study area. Reasonably foreseeable future actions generally include transportation system improvements and public infrastructure improvements. The impact of Alternative 2, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on trail administration and management. Alternative 2 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Trail Administration and Management – Alternative 3 (Chesapeake Region in the 17th Century)**

Under Alternative 3, partners would continue to be responsible for day-to-day trail management and operations activities at their resource and access sites. NPS would provide funding to partners through the CBGN program. NPS would also provide technical assistance on interpretive and education programs for the trail along with providing brochures, signs, and displays about the trail. The emphasis of interpretive programs would be on the John Smith voyage story, the American Indian experience in the Chesapeake Bay area at the time of Smith's voyages, and the natural environment along the trail during the Smith voyages.

For Alternative 3, NPS funding could be available to assist partners in acquiring new significant landing sites as well as American Indian sites, archeological sites, and sites supporting pristine evocative landscapes similar to those present during Smith's voyages. Responsibility for management and maintenance of these new sites would be with the partners participating in the new acquisitions. If no partners participate in the acquisition, then NPS would own and manage the site.

NPS would work with partners to establish one or two John Smith voyage trail interpretive centers at partner sites. Existing buildings at partner sites would be used for the new interpretive centers. NPS would contribute to the funding for operating the interpretive centers, and assist partners and volunteers with staffing. NPS would provide technical expertise in creating displays, signage, and maps of the trail, as well as training partner staff and volunteers on working at the interpretive centers. NPS staff could also conduct interpretive and educational programs at interpretive centers and lead field trips along the trail. NPS would likely share responsibilities with partners in the day-to-day management and operations of the interpretive centers.

Overall, the implementation of Alternative 3 would likely have moderate long-term beneficial impacts on trail administration and management. These impacts could result from potential consistent and integrated

management and operations at trail sites, potential funding for new resource and access sites, and potential funding and personnel for one or two new John Smith voyage interpretive centers at partner sites along the trail.

Cumulative Impacts on Trail Administration and Management. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail administration and management in and around the study area. Reasonably foreseeable future actions generally include transportation system improvements and public infrastructure improvements. The impact of Alternative 3, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on trail administration and management. Alternative 3 would contribute an imperceptible impact to the total cumulative impact.

■ **Impacts on Trail Administration and Management – Alternative 4 (Recreation on the Historic Trail)**

Under Alternative 4, partners would continue to be responsible for the day-to-day trail management and operations activities at their resource and access sites. NPS would provide funding to partners through the CBGN program. NPS would also provide technical assistance on interpretive and education programs for the trail along with providing brochures, signs, and displays about the trail. The emphasis for interpretive programs would be on recreation and getting visitors out on the trail. NPS would assist partners in providing volunteer programs such as cleanups or habitat restoration projects along the trail.

NPS would work with partners to acquire new access sites as needed along the trail. Management, including maintenance of any new access sites would be done by partners and/or the NPS if no partners participated in the acquisition.

For Alternative 4, NPS input would be limited to CBGN funding, assisting partners in acquiring new access sites, and assisting partners in providing volunteer programs and improving recreation opportunities along the trail.

Overall, the implementation of Alternative 4 would likely have moderate long-term beneficial impacts on trail administration and management as a result of potential consistent and integrated management and operations at trail sites.

Cumulative Impacts on Trail Administration and Management. Past, present, and reasonably foreseeable future actions have and continue to contribute impacts to trail administration and management in and around the study area. Reasonably foreseeable future actions generally include transportation system improvements and public infrastructure improvements. The impact of Alternative 4, in conjunction with the impacts of these actions would result in a cumulative long-term negligible adverse impact on trail administration and management. Alternative 4 would contribute an imperceptible impact to the total cumulative impact.

■ **Conclusion – Impacts on Trail Administration and Management**

Alternative 1 would likely result in negligible impacts on trail administration and management.

Alternative 2 would likely result in moderate long-term beneficial impacts on trail administration and management because of potential for consistent and integrated management and operations at trail sites; more consistent signage, displays, maps, interpretive materials; and improved access to the trail.

Alternative 3 would likely result in moderate long-term beneficial impacts on trail administration and management because of potential for consistent and integrated management and operations at trail sites, potential funding for new resource and access sites, and potential funding and personnel for one or two new John Smith voyage interpretive centers at partner sites along the trail.

Alternative 4 would likely result in moderate long-term beneficial impacts on trail administration and management as a result of potential consistent and integrated management and operations at trail sites.



CHAPTER 6 CONSULTATION AND COORDINATION

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6.0 Consultation and Coordination

6.1 Public Involvement and Agency Coordination

Since beginning the CMP planning process the NPS has reached out to the public on numerous occasions for input regarding trail management issues, the range of alternatives under consideration, and the types of impacts to be addressed in the trail's new plan. This process – referred to as scoping – has involved the general public, interested individuals, civic organizations, trail user groups, American Indian tribes, and various federal, state, and local agencies. As the planning process has progressed the NPS has provided information and updates via newsletters, news releases, the trail website, briefings, and public workshops.

Table 6.1 below provides a running list of the consultations and public involvement activities. The key issues considered in the CMP planning process – developed through the analysis of issues and concerns related to park management – are discussed above in section 1.5.3. Also appendix M contains relevant correspondence with agencies and American Indian tribes.

Table 6.1 Summary of Agency Coordination and Public Involvement

Date	Consultation or Public Involvement Activity
March 10, 2007	CBGN Working Group, discussion of CBGN/CAJO coordination
September 7, 2007	Interpretive planning meeting, Jamestown, VA
September 26, 2007	Interpretive planning meeting, Baltimore, MD
September 27, 2007	Interpretive planning meeting, Havre de Grace, MD
October 10, 2007	CAJO Superintendent briefing for the NPS Regional Director with regard to the role of the CAJO Advisory Council
November 27, 2007	Internal scoping meeting, Annapolis, MD
December 12, 2007	Interpretive planning meeting, Cambridge, MD
January 16, 2008	CBGN Working Group, discussion and feedback on public scoping issues
January 29, 2008	Interpretive planning meeting, Scotland, MD
January 31, 2008	MD DNR access meeting
January 31, 2008	Interpretive planning meeting, Onancock, VA
February 2008	Park Manager and CAJO Superintendent present CAJO briefing for Delaware Council on Greenways and Trails (Dover, DE)
February 5, 2008	Interpretive planning meeting, Accokeek, MD
February 13, 2008	Interpretive planning meeting, Grasonville, MD
February 26, 2008	Interpretive planning meeting, Fredericksburg, VA
March 13, 2008	Interpretive planning meeting, Seaford, DE
March 27, 2008	CAJO CMP/EA meeting with staff of the NPS Northeast Region Office

Table 6.1 Summary of Agency Coordination and Public Involvement

Date	Consultation or Public Involvement Activity
April 7, 2008	CAJO Superintendent and Trail Manager meet with the Chesapeake Conservancy to discuss roles, responsibilities, and collaboration
April 10, 2008	CMP Working Group meeting in Annapolis, MD, to discuss CMP purpose, need, objectives, and vision
May 29, 2008	CAJO presentation to the Maryland Preservation and Revitalization Conference, Hagerstown, MD
July 21, 2008	CAJO Advisory Council workshop, webinar format
September 5, 2008	Public scoping open house dress rehearsal
September 19, 2008	CAJO CMP Newsletter 1 – Public Scoping mailed to individuals and organizations on the trail mailing list
September 23, 2008 to November 7, 2008	Public comment period on public scoping
September 23, 2008	Public scoping open house meeting, Historic Jamestown Visitor Center, Jamestown, VA
September 24, 2008	Public open house meeting, scoping, Deltaville Community Center, Deltaville, VA
September 25, 2008	Public open house meeting, scoping, Indigo Landing, Alexandria, VA
September 30, 2008	Public open house meeting, scoping, Fort McHenry Visitor Center, Baltimore, MD
October 1, 2008	Public open house meeting, scoping, Seaford City Hall, Seaford, DE
October 2, 2008	Public open house meeting, scoping, Havre de Grace Maritime Museum, Havre de Grace, MD
October 7, 2008	Public open house meeting, scoping, Anheuser-Busch Coastal Research Center, Cape Charles, VA
October 8, 2008	Public open house meeting, scoping, Chesapeake Bay Maritime Museum, St. Michaels, MD
October 14, 2008	NPS Director and NOAA Vice Admiral sign cooperative agreement
October 15, 2008	CBGN Working Group, discussion of how to involve existing CBDN Partners in trail development
October 22, 2008	CAJO Advisory Council meeting, Jamestown, VA
November 5, 2008 to January 15, 2009	Public review period for the Draft Interpretive Plan
December 1, 2008	Briefing with NPS Deputy Regional Director, Annapolis, MD
December 10, 2008	National Wildlife Refuge Concept Plan meeting, Blackwater National Wildlife Refuge, Blackwater, MD
December 16, 2008	Agency scoping meeting with Virginia state agencies
April 24, 2009	Landscapes and viewsheds workshop, Annapolis, MD
May 22, 2009	CAJO Advisory Council workshop, St. Michaels, MD
May 23, 2009	CAJO Advisory Council public meeting, St. Michaels, MD
July 8, 2009	CBGN Working Group, discussion of CAJO website promotion
July 23, 2009	CAJO Planning Team Meeting, Annapolis Maritime Museum, Annapolis, MD
August 13, 2009	NER Deputy Director and NER Chief of Planning briefing on management alternatives, Philadelphia, PA
August 20, 2009	Cooperative agreement executed between the NPS and the Chesapeake Conservancy

Table 6.1 Summary of Agency Coordination and Public Involvement

Date	Consultation or Public Involvement Activity
September 2009	CAJO CMP Newsletter 2 – Preliminary Management Alternatives mailed to individuals and organizations on the trail mailing list
October 6, 2009	CAJO Advisory Council workshop, webinar format
October 10, 2009	CBGN Working Group, discussion of CAJO preliminary management alternatives
October 12, 2009 to December 1, 2009	Public comment period on preliminary management alternatives
October 12, 2009	Stakeholder meeting on preliminary management alternatives, Yorktown, VA
October 12, 2009	Public open house meeting, preliminary management alternatives, Yorktown, VA
October 13, 2009	Stakeholder meeting on preliminary management alternatives, Deltaville, VA
October 13, 2009	Public open house meeting, preliminary management alternatives, Deltaville, VA
October 14, 2009	Stakeholder meeting on preliminary management alternatives, Annapolis, MD
October 14, 2009	Public open house meeting, preliminary management alternatives, Annapolis, MD
October 15, 2009	Stakeholder meeting on preliminary management alternatives, Washington, DC
October 15, 2009	Public open house meeting, preliminary management alternatives, Washington, DC
October 19, 2009	Stakeholder meeting on preliminary management alternatives, Machipongo, VA
October 19, 2009	Public open house meeting, preliminary management alternatives, Machipongo, VA
October 20, 2009	Stakeholder meeting on preliminary management alternatives, Seaford, DE
October 20, 2009	Public open house meeting, preliminary management alternatives, Seaford, DE
October 21, 2009	Stakeholder meeting on preliminary management alternatives, St. Michaels, MD
October 21, 2009	Public open house meeting, preliminary management alternatives, St. Michaels, MD
October 22, 2009	Stakeholder meeting on preliminary management alternatives, Havre de Grace, MD
October 22, 2009	Public open house meeting, preliminary management alternatives, Havre de Grace, MD
November 12, 2009	CAJO Advisory Council public meeting, Washington, DC
March 12, 2010	CAJO Advisory Council workshop, Annapolis, MD

6.2 Tribal Coordination

Many American Indian tribes have historical ties to the Captain John Smith Chesapeake National Historic Trail. The NPS is responsible for consulting with these tribes during the CMP planning process if they are federally-recognized through a government-to-government relationship. Of the tribes with ties to the trail, only one – the Delaware Nation of Oklahoma located in Pennsylvania – is a federally-recognized tribe. Nevertheless, the NPS has honored the relationship of all tribes to the trail and has held consultations with them on numerous occasions since studies for the trail and its development began several years ago.

Beginning with work on the *Trail Feasibility Study* (NPS 2006), the NPS has consulted with the Virginia Council on Indians, an official entity established by the Commonwealth of Virginia, through their Program Manager, Deanna Beacham. Ms. Beacham served on the review team that developed the *Trail Feasibility Study* (NPS 2006) and gave valuable input and insights during that process. During the CMP planning process CAJO staff members conducted two briefings for the Maryland Commission on Indian Affairs, an official entity established by the Governor of the State of Maryland. Tribal members attended the trail's public open house workshops held in the fall of 2008 and 2009 and offered comment. Most important, American Indian representatives hold four seats on the Captain John Smith Chesapeake NHT Advisory Council. The council's purpose is to consult with the Secretary of the Interior on the development of the CMP and other matters relating to the trail. To date, the majority of comments received from these consultations have been related to interpretation and how the stories and histories of the Chesapeake Bay-area Indians have been and should be told.

On June 17, 2009, the NPS sent a consultation letter to the Delaware Nation of Oklahoma located in Pennsylvania (see appendix M). No response was received.

The Virginia Council on Indians, the Maryland Commission on Indian Affairs, the Delaware Nation of Oklahoma located in Pennsylvania, and other tribes with ties to the trail will receive a copy of the Draft CMP/EA for review and comment. In addition, the NPS will continue to consult with the tribes to enhance, strengthen, and appropriately respect and interpret the earliest human presence along the shores of the Chesapeake Bay. Future consultation will improve understanding and help achieve common goals during the implementation of the CMP.

6.3 Section 106 Consultation

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, requires that federal agencies consider the effect of undertakings on properties listed on the National Register of Historic Places and allow the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) the opportunity to comment. The general nature of the management objectives and potential actions in the CMP has necessitated that the analysis of impacts to cultural resources and related Section 106 consultation is general and programmatic. In the future Section, 106 compliance will occur during

design and construction of specific projects referenced in the CMP, if and when project funding becomes available. Table 6.2 provides a list of the general types of trail-related projects that would likely require consultation in the future.

During development of the CMP/EA, the NPS sent letters to the state historic preservation officers for Delaware, Maryland, Virginia, and the District of Columbia (see appendix M) to initiate consultation. The Maryland Historical Trust provided a written response on March 8, 2010 stating the need for future ongoing consultation with the Trust to avoid and minimize the potential for adverse effects on historic and archeological properties during trail development, as funding becomes available and planning progresses for specific undertakings. The Delaware and Virginia SHPOs did not provide a written response.

Further consultation with the SHPOs will occur during review of the Draft CMP/EA. Each SHPO will receive a copy of the plan. Following review of the Draft CMP/EA, additional conversations with the SHPOs will occur to address their comments and to develop a final list of actions subject to future Section 106 compliance review.

Table 6.2 CMP Implementation Actions Likely to Require Future Section 106 Consultation with State Historic Preservation Officers in Delaware, Maryland, Virginia, and the District of Columbia

Action	Alternative 1	Alternative 2	Alternative 3	Alternative 4
■ visitor contact facilities		□	□	□
■ public water access (canoe/kayak soft launch)	□	□	□	□
■ public water access (new or enhanced deep water launches)			□	□
■ day-use facilities	□	□	□	□
■ pull-offs	□	□	□	□
■ trails and trailheads		□	□	□
■ primitive camping facilities			□	□
■ developed campground				□
■ land acquisition (for conservation purposes)		□	□	□

6.4 Section 7 Consultation

Section 7 of the Endangered Species Act of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. NPS management policies also require cooperation with appropriate state conservation agencies to protect state-listed and candidate species of special concern within park boundaries.

On January 28, 2010, the NPS sent letters to the Delaware Natural Heritage and Endangered Species Program, the Maryland Wildlife and Heritage Program, and the Virginia Heritage Program (see appendix M) for consultation purposes and to request information about special status species within the trail corridor (generally described as extending 1,000 feet landward from the shoreline of the voyage routes). The state of Delaware responded on February 25, 2010, providing information regarding rare species of greatest conservation need, fisheries, state natural heritage sites, key wildlife habitat, state natural areas, and state wildlife management areas within the trail corridor along the Nanticoke River from the Delaware-Maryland state line to the mouth of Broad Creek; this information was meant to assist with site-specific conservation planning in the vicinity of trail projects during future trail development. The commonwealth of Virginia responded on March 1, 2010, requesting that the NPS provide further coordination once exact locations of proposed trail development actions are determined.

On February 18, 2010, the NPS sent letters to the Chesapeake Bay Field Office and the Virginia Field Office of the U.S. Fish and Wildlife Service (FWS) (see appendix M) for consultation purposes and to request information about special status species within the trail corridor (generally described as extending 1,000 feet landward from the shoreline of the voyage routes). Each consulted FWS field office responded via email, directing the NPS to a website to access a list of special status species within the trail corridor. The FWS field offices requested further consultation when the draft CMP is complete, and consultation including detailed maps when any specific shoreline sites are planned for development. The NPS will continue to consult with FWS in accordance with this request.

6.5 Draft CMP/EA Document Review

The Draft CMP/EA for the Captain John Smith Chesapeake National Historic Trail will be on public and agency review for 30 days. During the review period, the public will have opportunities to provide comments on the management alternatives, including the preferred alternative. The public will be able to comment on-line or in the form of email and letters, which must be post marked by the due date posted on the website.

Following the comment period the NPS planning team will evaluate comments received from other federal agencies, organizations, businesses, and individuals regarding the draft plan. It will then prepare a finding

of no significant impact (FONSI) document. The FONSI will incorporate changes made in response to the comments received, as appropriate, and will document the NPS selection of the preferred alternative. Once the FONSI is signed, the NPS will be able to proceed with implementation of management actions identified in the approved trail management plan.

As noted previously, the Draft CMP/EA presents an overview of potential actions and impacts related to the management concepts for the trail. Once the CMP is approved more detailed plans would be developed by the NPS and its partners for individual development and management projects along the trail, if and when funding becomes available. These plans would require and be subject to additional environmental compliance reviews, such as those required pursuant to NEPA and Section 106 of the NHPA, as amended.

6.6 List of Draft CMP/EA Recipients

Copies of the Draft CMP/EA were distributed to the following officials, government agencies, and non-government organizations and institutions. Copies were also distributed to approximately 400 individuals and other entities who requested the document or who are on the trail's public involvement mailing list.

■ Congressional Delegations

Delaware

Senator Edward E. Kaufman
 Senator Thomas R. Carper
 Rep. Michael N. Castle

Maryland

Senator Benjamin L. Cardin
 Senator Barbara A. Mikulski
 Rep. Donna F. Edwards
 Rep. C.A. Dutch Ruppersberger
 Rep. John Sarbanes
 Rep. Frank M. Kratovil, Jr.
 Rep. Steny H. Hoyer
 Rep. Roscoe G. Bartlett
 Rep. Elijah E. Cummings
 Rep. Chris Van Hollen

Virginia

Senator Mark Warner
 Senator Jim Webb
 Rep. Robert J. Wittman
 Rep. Glenn C. Nye III
 Rep. Robert C. Scott
 Rep. J. Randy Forbes
 Rep. Tom Perriello
 Rep. Eric Cantor
 Rep. James P. Moran
 Rep. Frank R. Wolf
 Rep. Gerald E. Connolly

District of Columbia

Delegate Eleanor Holmes Norton

■ Federal Agencies

Advisory Council on Historic Preservation
 Anacostia Park (National Capital Parks East)
 C&O Canal National Historic Park

Colonial National Historic Park

Fort McHenry National Monument and Historic Shrine

George Washington Birthplace National Monument

George Washington Parkway

Great Falls Park

Potomac Heritage National Scenic Trail

National Park Service – National Capital Region Office

National Park Service – Northeast Region Office

U.S. Fish and Wildlife Service – National Wildlife Refuges

- | | |
|---|---|
| <ul style="list-style-type: none">- Chesapeake Marshlands NWR Complex<ul style="list-style-type: none">Blackwater NWR (including Garrett Island)Eastern Neck NWRMartin NWRSusquehanna NWR- Patuxent Research Refuge- Potomac River NWR Complex<ul style="list-style-type: none">Featherstone NWRMason Neck NWROccoquan NWR | <ul style="list-style-type: none">- Eastern Virginia Rivers NWR Complex<ul style="list-style-type: none">James River NWRPlum Tree Island NWRPresquile NWRRappahannock River Valley NWR- Eastern Shore of Virginia NWR<ul style="list-style-type: none">Eastern Shore of Virginia NWRFisherman Island NWR- Great Dismal Swamp NWR<ul style="list-style-type: none">Nansemond NWR |
|---|---|

U.S. Fish and Wildlife Service – Ecological Services Field Offices

- Chesapeake Bay Office
- Virginia Field Office

U.S. Fish and Wildlife Service – Washington Office

U.S. Fish and Wildlife Service – Northeast Regional Office

US Department of Defense

US Environmental Protection Agency

National Oceanic and Atmospheric Administration

■ **State and Local Agencies and Officials**

Anne Arundel County Department of Recreation and Parks

Delaware Parks and Recreation

Delaware Tourism Office

District of Columbia Department of the Environment

Maryland Department of Natural Resources

Maryland Department of Planning

Maryland Office of Tourism Development

Maryland Historic Trust

Maryland-National Capital Park and Planning Commission (Montgomery County)

Northern Virginia Regional Park Authority
 Pennsylvania Department of Conservation and Natural Resources
 Preservation Virginia
 Queen Anne’s County Department of Parks and Recreation
 Rivanna Trails Foundation
 Virginia Department of Conservation and Recreation
 Virginia Department of Game and Inland Fisheries
 Virginia Department of Historic Resources
 Virginia Tourism Corporation

■ **Tribes and American Indian Organizations**

Accohannock Indian Tribe	Monacan Indian Nation
Assateague Tribe	Nansemond Tribe
Cedarville Band of Piscataway Indians	Nanticoke Indian Association
Chickahominy Tribe	Nause-Waiwash Indians
Conoy-Piscataway	Pamunkey Tribe
Delaware Nation	Piscataway Indian Nation
Eastern Chickahominy Tribe	Pocomoke Tribe
Lenape Tribe of Delaware	Rappahannock Tribe
Maryland Commission on Indian Affairs	Upper Mattaponi Tribe
Mattaponi Tribe	Virginia Council on Indians

■ **Partner Organizations**

Annapolis Maritime Museum	Historic St. Mary’s City
Battle Creek Cypress Swamp	Historic London Town and Garden
Caledon Natural Area State Park	Hoffler Creek Wildlife Foundation and Preserve
Calvert Marine Museum	Jefferson Patterson Park and Museum
Cape Charles Historic District	Kings Landing Park
Chesapeake Bay Maritime Museum	Lynnhaven River NOW
Chesapeake Beach Railway Museum	Marshy Point Park
Chesapeake Conservancy	Mathews Blueways Water Trail
Chickahominy Riverfront Park	Mattaponi and Pamunkey River Water Trail
Delmarva Discovery Center	Nanticoke River Water Trail
Deltaville Maritime Museum	Nauticus Maritime Center
Emperor’s Landing	Onancock Historic District and Town Wharf
Flag Ponds Nature Park	Piney Point Lighthouse Museum/St.
Great Bridge Lock Park	Clements Island
Havre de Grace Maritime Museum	

Piscataway Park	Solomons Visitor Information Center
Point Lookout	Sotterley Plantation
Powhatan Creek Blueway	Stratford Hall Plantation
Rappahannock River Water Trail	Sultana Projects, Inc.
Sailwinds Visitor Center	Tangier History Museum and Intercultural Center
Sassafras Natural Resource Management Area	Virginia Living Museum
Seaford Museum	